

**STATE OF VERMONT**  
**BEFORE THE**  
**PUBLIC SERVICE BOARD**

<b>INVESTIGATION INTO THE</b>	)	
<b>EXISTING RATES OF</b>	)	<b>) DOCKET NOS. 6946 AND</b>
<b>CENTRAL VERMONT PUBLIC</b>	)	<b>6988</b>
<b>SERVICE COMPANY</b>	)	

**DIRECT TESTIMONY**  
**OF**  
**DR. J. RANDALL WOOLRIDGE**

**October, 2004**

**Purpose of Testimony:** Dr. Woolridge provides an opinion as to the overall fair rate of return or cost of capital for Central Vermont Public Service Company and evaluates the Company's rate of return testimony in this proceeding.

**CENTRAL VERMONT PUBLIC SERVICE COMPANY**  
**Docket Nos. 6946 and 6988**

**Direct Testimony of**  
**Dr. J. Randall Woolridge**

---

**TABLE OF CONTENTS**

I.	Subject of Testimony and Summary of Recommendations	.	.	.	.	.	.	1
II.	Comparison Group Selection	.	.	.	.	.	.	7
III.	Capital Structure Ratios and Debt Cost Rates.	.	.	.	.	.	.	8
IV.	The Cost of Common Equity Capital	.	.	.	.	.	.	9
	A. Overview	.	.	.	.	.	.	9
	B. Discounted Cash Flow Analysis	.	.	.	.	.	.	15
	C. CAPM	.	.	.	.	.	.	24
	D. Equity Cost Rate Summary	.	.	.	.	.	.	45
V.	Critique of CVPS's Rate of Return Testimony	.	.	.	.	.	.	47
	APPENDIX A - Qualifications of Dr. J. Randall Woolridge	.	.	.	.	.	.	68

---

**LIST OF EXHIBIT**

**Exhibit**

**Title**

JRW-1	Recommended Rate of Return
JRW-2	The Impact of the 2003 Tax Law on Required Returns
JRW-3	Summary Financial Statistics
JRW-4	Public Utility Capital Cost Indicators
JRW-5	Industry Average Betas
JRW-6	DCF Study
JRW-7	CAPM Study
JRW-8	Historic Equity Risk Premium Evaluation

1 **Q. PLEASE STATE YOUR FULL NAME, ADDRESS, AND OCCUPATION.**

2 A. My name is J. Randall Woolridge and my business address is 120 Haymaker Circle, State  
3 College, PA 16801. I am a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal  
4 Endowed University Fellow in Business Administration at the University Park Campus of the  
5 Pennsylvania State University. I am also the Director of the Smeal College Trading Room. In addition,  
6 I am affiliated with the Columbia Group Inc., a public utility consulting firm based in Georgetown, CT.  
7 A summary of my educational background, research, and related business experience is provided in  
8 Appendix A.

9  
10 **I. SUBJECT OF TESTIMONY AND**

11 **SUMMARY OF RECOMMENDATIONS**

12  
13 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

14 A. I have been asked by the Department of Public Service to provide an opinion as to the overall  
15 fair rate of return or cost of capital for Central Vermont Public Service Company ("CVPS" or  
16 "Company") and to evaluate CVPS's rate of return testimony in this proceeding.

17 **Q. PLEASE REVIEW YOUR COST OF CAPITAL RETURN FINDINGS.**

18 A. I have independently arrived at a cost of capital for the Company. I have established an equity  
19 cost rate of 8.75% for CVPS primarily by applying the Discounted Cash Flow ("DCF") approach to a  
20 group of electric utility companies. I have also performed a Capital Asset Pricing Model ("CAPM")  
21 study. Utilizing my equity cost rate, capital structure ratios, and senior capital cost rates, I am  
22 recommending an overall fair rate of return for the Company of 7.45%. This recommendation is

summarized in Exhibit\_(JRW-1).

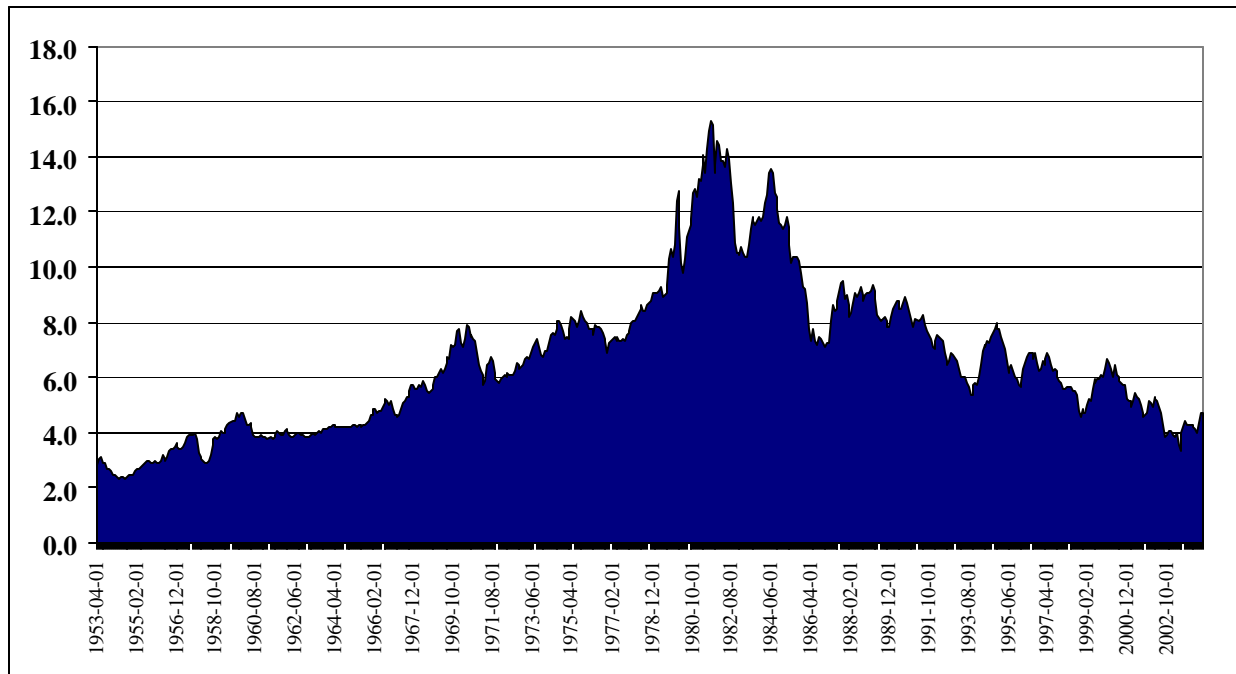
**Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF THE COMPANY'S RATE OF RETURN POSITION.**

A. The Company's rate of return testimony is offered by Ms. Jean H. Gibson and Mr. James C. Cater. Ms. Gibson proposes the Company's senior capital cost rates and capital structure and Mr. Cater recommends the equity cost rate. CVPS's proposed rate of return is excessive due to an overstated equity cost rate. Mr. Cater's estimated equity cost rate of 11.00% is unreasonably high primarily due to (1) an excessive and upwardly-biased growth rate in his DCF equity cost rate, and (2) seriously flawed Capital Asset Pricing Model (CAPM) and Risk Premium (RP) studies.

**Q. PLEASE DISCUSS CAPITAL COSTS IN TODAY'S MARKETS.**

A. Capital cost rates for U.S. corporations are currently at their lowest levels in more than four decades. Corporate capital cost rates are determined by the level of interest rates and the risk premium demanded by investors to buy the debt and equity capital of corporate issuers. The base level of interest rates in the US economy is indicated by the rates on U.S. Treasury bonds. The benchmark for long-term capital costs is the rate on ten-year Treasury bonds. The rates are provided in the graph below from 1953 to the present. As indicated, prior to the secular decline in rates that began last year, the 10-year Treasury had not been in the 4-5 percent range since the 1960s.

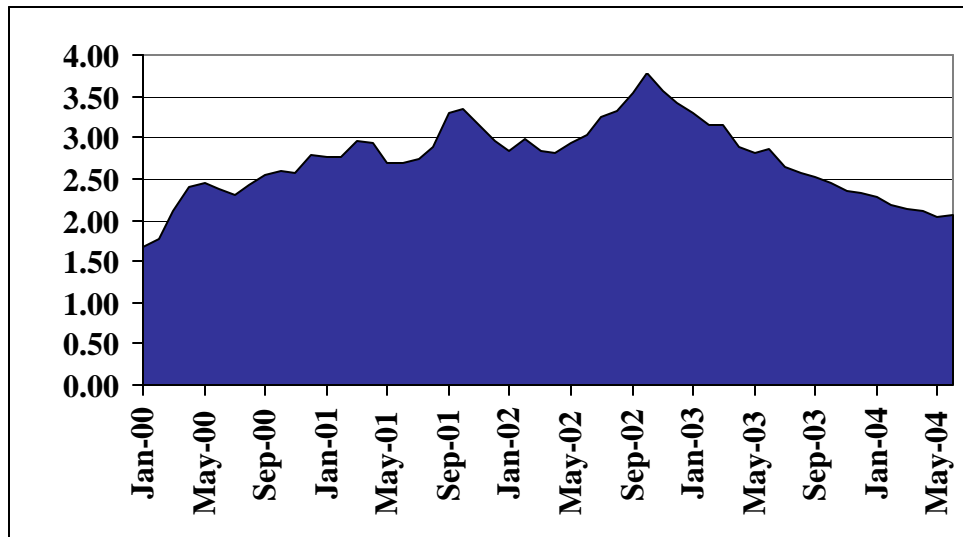
**Yields on Ten-Year Treasury Bonds  
1953-Present**



Source: <http://research.stlouisfed.org/fred2/data/GS10.txt>

The second base component of the corporate capital cost rates is the risk premium. The risk premium is the return premium required by investors to purchase riskier securities. Risk premiums for bonds are the yield differentials between different bond classes as rated by agencies such as Moody's, and Standard and Poor's. The graph below provides the yield differential between Baa-rate corporate bonds and 10-year Treasuries. This yield differential peaked at 350 basis points (BPs) in 2002 and has declined significantly since that time. This is an indication that the market price of risk has declined and therefore the risk premium has declined in recent years.

### Corporate Bond Yield Spreads Baa-Rated Corporate Bond Yield Minus Ten-Year Treasury Bond Yield



Source: <http://www.treas.gov/offices/domestic-finance/debt-management/interest-rate/index.html>

The equity risk premium is the return premium required to purchase stocks as opposed to bonds. Since the equity risk premium is not readily observable in the markets (as are bond risk premiums), and there are alternative approaches to estimating the equity premium, it is the subject of much debate. One way to estimate the equity risk premium is to compare the mean returns on bonds and stocks over long historic periods. Measured in this manner, the equity risk premium has been in the 5-7 percent range. But recent studies by leading academics indicate the forward-looking equity risk premium is in the 3-4 percent range. These authors indicate that historic equity risk premiums are upwardly biased measures of expected equity risk premiums. Jeremy Siegel, a Wharton finance professor and author of the popular book *Stocks for the Long Term*, published a study entitled “The Shrinking Equity Risk Premium.”<sup>1</sup> He concludes:

<sup>1</sup> Jeremy J. Siegel, “The Shrinking Equity Risk Premium,” *The Journal of Portfolio Management* (Fall, 1999), p.15.

1 The degree of the equity risk premium calculated from data estimated  
2 from 1926 is unlikely to persist in the future. The real return on fixed-  
3 income assets is likely to be significantly higher than estimated on earlier  
4 data. This is confirmed by the yields available on Treasury index-linked  
5 securities, which currently exceed 4%. Furthermore, despite the  
6 acceleration in earnings growth, the return on equities is likely to fall  
7 from its historical level due to the very high level of equity prices relative  
8 to fundamentals.  
9

10 Even Alan Greenspan, the Chairman of the Federal Reserve Board, indicated in an October 14,  
11 1999, speech on financial risk that the fact that equity risk premiums have declined during the  
12 past decade is “not in dispute.” His assessment focused on the relationship between information  
13 availability and equity risk premiums.

14 There can be little doubt that the dramatic improvements in information  
15 technology in recent years have altered our approach to risk. Some  
16 analysts perceive that information technology has permanently lowered  
17 equity premiums and, hence, permanently raised the prices of the  
18 collateral that underlies all financial assets.  
19

20 The reason, of course, is that information is critical to the evaluation of  
21 risk. The less that is known about the current state of a market or a  
22 venture, the less the ability to project future outcomes and, hence, the  
23 more those potential outcomes will be discounted.  
24

25 The rise in the availability of real-time information has reduced the  
26 uncertainties and thereby lowered the variances that we employ to guide  
27 portfolio decisions. At least part of the observed fall in equity premiums  
28 in our economy and others over the past five years does not appear to  
29 be the result of ephemeral changes in perceptions. It is presumably the  
30 result of a permanent technology-driven increase in information  
31 availability, which by definition reduces uncertainty and therefore risk  
32 premiums. This decline is most evident in equity risk premiums. It is less  
33 clear in the corporate bond market, where relative supplies of corporate  
34 and Treasury bonds and other factors we cannot easily identify have  
35 outweighed the effects of more readily available information about

1                   borrowers.<sup>2</sup>  
2

3           In sum, the relatively low interest rates in today's markets as well as the lower risk premiums  
4 required by investors indicate that capital costs for U.S. companies are the lowest in decades. In  
5 addition, last year's new tax law further lowered capital cost rates for companies.

6   **Q.     HOW DID LAST YEAR'S NEW TAX LAW REDUCE THE COST OF CAPITAL**  
7 **FOR COMPANIES?**

8   A.   On May 28<sup>th</sup> of last year, President Bush signed the *Jobs and Growth Tax Relief Reconciliation*  
9 *Act of 2003*. The primary purpose of this legislation was to reduce taxes to enhance economic growth.  
10 A primary component of the new tax law was a significant reduction in the taxation of corporate  
11 dividends for individuals. Dividends have been described as "double-taxed." First, corporations pay  
12 taxes on the income they earn before they pay dividends to investors, then investors pay taxes on the  
13 dividends that they receive from corporations. One of the implications of the double taxation of  
14 dividends is that, all else equal, it results in a higher cost of raising capital for corporations. The new tax  
15 legislation reduces the effect of double taxation of dividends by lowering the tax rate on dividends from  
16 the 30 percent range (the average tax bracket for individuals) to 15 percent.

17       Overall, the new tax law reduced the pre-tax return requirements of investors, thereby reducing  
18 corporations' cost of equity capital. This is because the reduction in the taxation of dividends for  
19 individuals enhances their after-tax returns and thereby reduces their pre-tax required returns. This  
20 reduction in pre-tax required returns (due to the lower tax on dividends) effectively reduces the cost of

---

<sup>2</sup> Alan Greenspan, "Measuring Financial Risk in the Twenty-First Century," Office of the Comptroller of the Currency Conference, October 14, 1999.



1 equity capital for companies. The new tax law also reduced the tax rate on long-term capital gains from  
2 20% to 15%. The magnitude of the reduction in corporate equity cost rates is debatable, but my  
3 assessment indicates that it could be as large as 100 basis points. (See Exhibit\_(JRW-2).

## 4 5 **II. COMPARISON GROUP SELECTION**

6  
7 **Q. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF**  
8 **RETURN RECOMMENDATION FOR CVPS.**

9 A. To develop a fair rate of return recommendation for CVPS, I evaluated the return requirements  
10 of investors on the common stock of a group of electric utility companies.

11 **Q. PLEASE DESCRIBE YOUR GROUP OF ELECTRIC UTILITY COMPANIES.**

12 A. I have adopted Mr. Cater's group of electric utility companies. Summary financial statistics for  
13 the group are provided in Exhibit\_(JRW-3). These statistics indicate that CVPS is smaller than the  
14 group and its financial performance is below the average of the group. In terms of size, CVPS's  
15 operating revenues of \$904.7M are far below the group average of \$6,624.7M. In addition, CVPS  
16 pre-tax interest coverage of 2.60 and 2004 return on equity of 9.0% are below the average for the  
17 group, which are 3.18 and 12.0%, respectively. One glaring difference between CVPS and the group  
18 is the common equity ratio. CVPS's common equity ratio of 59.0 is almost twenty percentage points  
19 above the average for the group (36.7). This indicates that the financial risk of CVPS, in terms of the  
20 degree of financial leverage, is much less than the average for the group. This issue is addressed later in

the testimony.

### III. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

**Q. WHAT ARE THE COMPANY'S PROPOSED CAPITAL STRUCTURE RATIOS AND SENIOR CAPITAL COST RATES?**

A. CVPS has proposed the following capital structure ratios as of April 1, 2005: 39.75% long-term debt, 4.72% preferred stock, and 55.53% common equity. Whereas this capitalization contains considerable more equity capital than Mr. Cater's group of electric utilities, I will employ CVPS's proposed capitalization. I will also employ CVPS's proposed preferred stock and long-term debt cost rates of 5.77% and 6.31%. As such, the capital structure and senior capital cost rates for CVPS are:

**CVPS Company  
Capital Structure and Senior Capital Cost Rates  
April 1, 2005**

<b>Source of Capital</b>	<b>Capitalization Ratio</b>	<b>Cost Rate</b>
<b>Long-Term Debt</b>	<b>39.75%</b>	<b>5.77%</b>
<b>Preferred Stock</b>	<b>4.72%</b>	<b>6.31%</b>
<b>Common Equity</b>	<b>55.53%</b>	

### **IV. THE COST OF COMMON EQUITY CAPITAL**

#### **A. OVERVIEW**

**Q. WHY MUST AN OVERALL COST OF CAPITAL OR FAIR RATE OF RETURN BE**

1   **ESTABLISHED FOR A PUBLIC UTILITY?**

2   A.     In a competitive industry, the return on a firm's common equity capital is determined through the  
3   competitive market for its goods and services. Due to the capital requirements needed to provide utility  
4   services, however, and to the economic benefit to society from avoiding duplication of these services,  
5   some public utilities are monopolies. It is not appropriate to permit monopoly utilities to set their own  
6   prices because of the lack of competition and the essential nature of the services. Thus, regulation seeks  
7   to establish prices which are fair to consumers and at the same time are sufficient to meet the operating  
8   and capital costs of the utility, i.e., provide an adequate return on capital to attract investors.

9   **Q.     PLEASE PROVIDE AN OVERVIEW OF THE COST OF CAPITAL IN THE**  
10 **CONTEXT OF THE THEORY OF THE FIRM.**

11 A.     The total cost of operating a business includes the cost of capital. The cost of common equity  
12 capital is the expected return on a firm's common stock that the marginal investor would deem sufficient  
13 to compensate for risk and the time value of money. In equilibrium, the expected and required rates of  
14 return on a company's common stock are equal.

15         Normative economic models of the firm, developed under very restrictive assumptions, provide  
16 insight into the relationship between firm performance or profitability, capital costs, and the value of the  
17 firm. Under the economist's ideal model of perfect competition, where entry and exit is costless,  
18 products are undifferentiated, and there are increasing marginal costs of production, firms produce up to  
19 the point where price equals marginal cost. Over time, a long-run equilibrium is established where price  
20 equals average cost, including the firm's capital costs. In equilibrium, total revenues equal total costs,  
21 and because capital costs represent investors' required return on the firm's capital, actual returns equal

1 required returns and the market value and the book value of the firm's securities must be equal.

2 In the real world, firms can achieve competitive advantage due to product market imperfections  
3 - most notably through product differentiation (adding real or perceived value to products) and  
4 achieving economies of scale (decreasing marginal costs of production). Competitive advantage allows  
5 firms to price products above average cost and thereby earn accounting profits greater than those  
6 required to cover capital costs. When these profits are in excess of that required by investors, or when  
7 a firm earns a return on equity in excess of its cost of equity, investors respond by valuing the firm's  
8 equity in excess of its book value.

9 James M. McTaggart, founder of the international management consulting firm Marakon  
10 Associates, has described this essential relationship between the return on equity, the cost of equity, and  
11 the market-to-book ratio in the following manner:<sup>3</sup>

12 Fundamentally, the value of a company is determined by the cash flow it  
13 generates over time for its owners, and the minimum acceptable rate of return required  
14 by capital investors. This "cost of equity capital" is used to discount the expected equity  
15 cash flow, converting it to a present value. The cash flow is, in turn, produced by the  
16 interaction of a company's return on equity and the annual rate of equity growth. High  
17 return on equity (ROE) companies in low-growth markets, such as Kellogg, are  
18 prodigious generators of cash flow, while low ROE companies in high-growth markets,  
19 such as Texas Instruments, barely generate enough cash flow to finance growth.

20  
21 A company's ROE over time, relative to its cost of equity, also determines  
22 whether it is worth more or less than its book value. If its ROE is consistently greater  
23 than the cost of equity capital (the investor's minimum acceptable return), the business is  
24 economically profitable and its market value will exceed book value. If, however, the  
25 business earns an ROE consistently less than its cost of equity, it is economically  
26 unprofitable and its market value will be less than book value.  
27

---

<sup>3</sup> James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1988), p. 2.

1 As such, the relationship between a firm's return on equity, cost of equity, and market-to-book ratio is  
2 relatively straightforward. A firm which earns a return on equity above its cost of equity will see its  
3 common stock sell at a price above its book value. Conversely, a firm which earns a return on equity  
4 below its cost of equity will see its common stock sell at a price below its book value.

5 **Q. WHAT ECONOMIC FACTORS HAVE AFFECTED THE COST OF EQUITY**  
6 **CAPITAL FOR PUBLIC UTILITIES?**

7 A. Exhibit\_(JRW-4) provides indicators of public utility equity cost rates over the past decade.  
8 Page 1 shows the yields on 'A' rated public utility bonds. These yields peaked in the early 1990s at  
9 10%, and have generally declined since that time. In particular, over the past two years they have  
10 declined from the seven percent range to the five percent range. In recent months, the yield was 5.3%.  
11 Page 2 provides the dividend yields for the fifteen utilities in the Dow Jones Utilities Average over the  
12 past decade. These yields peaked in 1994 at 6.7%. Since that time they have declined and have  
13 remained in the 4.5-5.0 percent range in recent years.

14 Average earned returns on common equity and market-to-book ratios are given on page 3 of  
15 Exhibit\_(JRW-4). Over the past decade, earned returns on common equity have consistently been in  
16 the 10.0 - 13.0 percent range. The low point was 10.3 % in 1997 and they have increased to 12.5  
17 percent range as of the year 2003. Over the past decade, market-to-book ratios for this group  
18 bottomed out at 128% in 1994 and they have increased to the 150-180 percent range in recent years.

19 The indicators in Exhibit\_(JRW-4), coupled with the overall decrease in interest rates, suggest  
20 that capital costs for the Dow Jones Utilities have decreased over the past decade. Specifically for the  
21 equity cost rate, the significant increase in the market-to-book ratios, coupled with only a much smaller

1 increase in the average return on equity, suggests a substantial decline in the overall equity cost rate.

2 **Q. WHAT FACTORS DETERMINE INVESTORS' EXPECTED OR REQUIRED**  
3 **RATE OF RETURN ON EQUITY?**

4 A. The expected or required rate of return on common stock is a function of market-wide, as well  
5 as company-specific, factors. The most important market factor is the time value of money as indicated  
6 by the level of interest rates in the economy. Common stock investor requirements generally increase  
7 and decrease with like changes in interest rates. The perceived risk of a firm is the predominant factor  
8 that influences investor return requirements on a company-specific basis. A firm's investment risk is  
9 often separated into business and financial risk. Business risk encompasses all factors that affect a firm's  
10 operating revenues and expenses. Financial risk results from incurring fixed obligations in the form of  
11 debt in financing its assets.

12 **Q. HOW DOES THE INVESTMENT RISK OF ELECTRIC UTILITY COMPANIES**  
13 **COMPARE WITH THAT OF OTHER INDUSTRIES?**

14 A. Due to the essential nature of their service as well as their regulated status, public utilities are  
15 exposed to a lesser degree of business risk than other, non-regulated businesses. The relatively low  
16 level of business risk allows public utilities to meet much of their capital requirements through borrowing  
17 in the financial markets, thereby incurring greater than average financial risk. Nonetheless, the overall  
18 investment risk of public utilities is below most other industries. Exhibit\_(JRW-5) provides an  
19 assessment of investment risk for 100 industries as measured by beta, which according to modern  
20 capital market theory is the only relevant measure of investment risk that need be of concern for  
21 investors. These betas come from the *Value Line Investment Survey* and are compiled by Aswath

Damodaran of New York University. They may be found on the Internet at <http://www.stern.nyu.edu/~adamodar/>. The study shows that the investment risk of public utilities is quite low. In fact, the average beta for the electric utility is .77, which ranks in the lowest third of the 100 industries. As such, the cost of equity for the electric utility industry is among the lowest of all industries in the U.S.

**Q. HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON COMMON EQUITY CAPITAL BE DETERMINED?**

A. The costs of debt and preferred stock are normally based on historic or book values and can be determined with a great degree of accuracy. The cost of common equity capital, however, cannot be determined precisely and must instead be estimated from market data and informed judgment. This return to the stockholder should be commensurate with returns on investments in other enterprises having comparable risks.

According to valuation principles, the present value of an asset equals the discounted value of its expected future cash flows. Investors discount these expected cash flows at their required rate of return that, as noted above, reflects the time value of money and the perceived riskiness of the expected future cash flows. As such, the cost of common equity is the rate at which investors discount expected cash flows associated with common stock ownership.

Models have been developed to ascertain the cost of common equity capital for a firm. Each model, however, has been developed using restrictive economic assumptions. Consequently, judgment is required in selecting appropriate financial valuation models to estimate a firm's cost of common equity capital, in determining the data inputs for these models, and in interpreting the models' results. All of

1 these decisions must take into consideration the firm involved as well as conditions in the economy and  
2 the financial markets.

3 **Q. HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY CAPITAL FOR**  
4 **THE COMPANY?**

5 A. I rely primarily on the discounted cash flow model to estimate the cost of equity capital. I  
6 believe that the DCF model provides the best measure of equity cost rates for public utilities. I have  
7 also performed a Capital Asset Pricing Model (CAPM) study, but I give these results less weight  
8 because I believe that risk premium studies, of which the CAPM is one form, provide a less reliable  
9 indication of equity cost rates for public utilities.

10  
11 **B. DISCOUNTED CASH FLOW ANALYSIS**

12  
13 **Q. BRIEFLY DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF**  
14 **MODEL.**

15 A. According to the discounted cash flow model, the current stock price is equal to the discounted  
16 value of all future dividends that investors expect to receive from investment in the firm. As such,  
17 stockholders' returns ultimately result from current as well as future dividends. As owners of a  
18 corporation, common stockholders are entitled to a pro-rata share of the firm's earnings. The DCF  
19 model presumes that earnings that are not paid out in the form of dividends are reinvested in the firm so  
20 as to provide for future growth in earnings and dividends. The rate at which investors discount future  
21 dividends, which reflects the timing and riskiness of the expected cash flows, is interpreted as the



market's expected or required return on the common stock. Therefore this discount rate represents the cost of common equity. Algebraically, the DCF model can be expressed as:

$$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_n}{(1+k)^n}$$

where P is the current stock price,  $D_n$  is the dividend in year n, and k is the cost of common equity.

**Q. IS THE DCF MODEL CONSISTENT WITH VALUATION TECHNIQUES EMPLOYED BY INVESTMENT FIRMS?**

A. Yes. Virtually all investment firms use some form of the DCF model as a valuation technique. One common application for investment firms is called the three-stage DCF or dividend discount model (DDM). The stages in a three-stage DCF model are discussed below. This model presumes that a company's dividend payout progresses initially through a growth stage, then proceeds through a transition stage, and finally assumes a steady state stage. The dividend payment stage of a firm depends on the profitability of its internal investments, which, in turn, is largely a function of the life cycle of the product or service. These stages are depicted in the graphic below labeled the Three Stage DCF Model.<sup>4</sup>

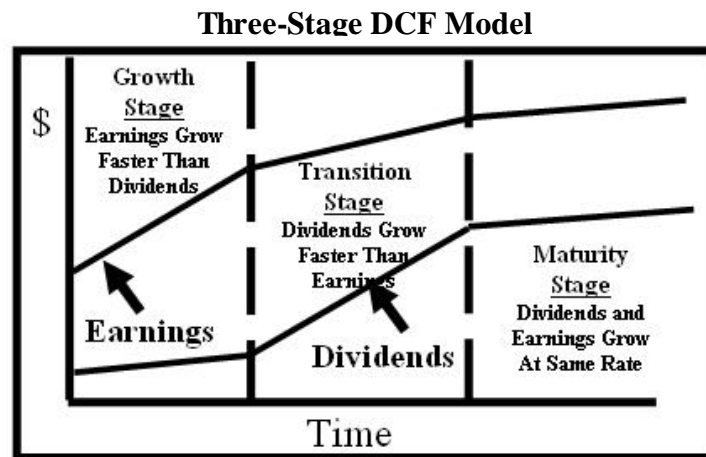
1. **Growth stage:** Characterized by rapidly expanding sales, high profit margins, and abnormally high growth in earnings per share. Because of highly profitable expected investment opportunities, the payout ratio is low. Competitors are attracted by the unusually high earnings, leading to a decline in the growth rate.
2. **Transition stage:** In later years, increased competition reduces profit margins and earnings growth slows. With fewer new investment opportunities, the company begins to

---

<sup>4</sup> This description comes from William F. Sharp, Gordon J. Alexander, and Jeffrey V. Bailey, *Investments* (Prentice-Hall, 1995), pp. 590-91.

pay out a larger percentage of earnings.

3. **Maturity (steady-state) stage:** Eventually the company reaches a position where its new investment opportunities offer, on average, only slightly attractive returns on equity. At that time its earnings growth rate, payout ratio, and return on equity stabilize for the remainder of its life. The constant-growth DCF model is appropriate when a firm is in the maturity stage of the life cycle.



In using this model to estimate a firm's cost of equity capital, dividends are projected into the future using the different growth rates in the alternative stages, and then the equity cost rate is the discount rate that equates the present value of the future dividends to the current stock price.

**Q. HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR REQUIRED RATE OF RETURN USING THE DCF MODEL?**

A. Under certain assumptions, including a constant and infinite expected growth rate, and constant dividend/earnings and price/earnings ratios, the DCF model can be simplified to the following:

$$P = \frac{D_1}{r - g}$$

$$k - g$$

where  $D_1$  represents the expected dividend over the coming year and  $g$  is the expected growth rate of dividends. This is known as the constant-growth version of the DCF model. To use the constant-growth DCF model to estimate a firm's cost of equity, one solves for  $k$  in the above expression to obtain the following:

$$k = \frac{D_1}{P} + g$$

Given the regulated status of public utilities, and especially the fact that their returns on investment are effectively set through the ratemaking process, the industry would be in the steady-state stage of a three-stage DCF. The DCF valuation procedure for companies in this stage is the constant-growth DCF. In the constant-growth version of the DCF model, the current dividend payment and stock price are directly observable. Therefore, the primary problem and controversy in applying the DCF model to estimate equity cost rates entails estimating investors' expected dividend growth rate

**Q. WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF METHODOLOGY?**

A. One should be sensitive to several factors when using the DCF model to estimate a firm's cost of equity capital. In general, one must recognize the assumptions under which the DCF model was developed in estimating its components (the dividend yield and expected growth rate). The dividend yield can be measured precisely at any point in time, but tends to vary somewhat over time. Estimation of expected growth is considerably more difficult. One must consider recent firm performance, in

1 conjunction with current economic developments and other information available to investors, to  
2 accurately estimate investors' expectations.

3 **Q. PLEASE DISCUSS EXHIBIT\_(JRW-6).**

4 A. My DCF analysis is provided in Exhibit\_(JRW-6). The DCF summary is on page 1 of this  
5 Exhibit and the supporting data and analysis for the dividend yield and expected growth rate are  
6 provided on the following pages.

7 **Q. WHAT DIVIDEND YIELD DO YOU EMPLOY IN YOUR DCF ANALYSIS FOR**  
8 **YOUR GROUP OF ELECTRIC UTILITY COMPANIES?**

9 A. The dividend yields on the common stock for the companies in the electric utility group are  
10 provided on page 2 of Exhibit\_(JRW-6) for the twelve-month period ending September, 2004. Over  
11 this period, the average monthly dividend yields for the group is 4.40%. As of September, 2004, the  
12 mean dividend yield for the group is 4.00%. For the DCF dividend yields for the group, I use the  
13 average of the twelve month and September, 2004 dividend yields. Hence, the DCF dividends yield for  
14 the electric utility group is 4.20%.

15 **Q. PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT**  
16 **DIVIDEND YIELD.**

17 A. According to the traditional DCF model, the dividend yield term relates to the dividend yield  
18 over the coming period. As indicated by Professor Myron Gordon, who is commonly associated with  
19 the development of the DCF model for popular use, this is obtained by (1) multiplying the expected  
20 dividend over the coming quarter by 4, and (2) dividing this dividend by the current stock price to

1 determine the appropriate dividend yield for a firm, which pays dividends on a quarterly basis.<sup>5</sup>

2 In applying the DCF model, some analysts adjust the current dividend for growth over the  
3 coming year as opposed to the coming quarter. This can be complicated because firms tend to  
4 announce changes in dividends at different times during the year. As such, the dividend yield computed  
5 based on presumed growth over the coming quarter as opposed to the coming year can be quite  
6 different. Consequently, it is common for analysts to adjust the dividend yield by some fraction of the  
7 long-term expected growth rate.

8 The appropriate adjustment to the dividend yield is further complicated in the regulatory process  
9 when the overall cost of capital is applied to a projected or end-of-future-test-year rate base. The net  
10 effect of this application is an overstatement of the equity cost rate estimate derived from the DCF  
11 model. In the context of the constant-growth DCF model, both the adjusted dividend yield and the  
12 growth component are overstated. Put simply, the overstatement results from applying an equity cost  
13 rate computed using current market data to a future or test-year-end rate base which includes growth  
14 associated with the retention of earnings during the year.

15 **Q. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR WILL YOU USE**  
16 **FOR YOUR DIVIDEND YIELD?**

17 A. I will adjust the dividend yield for the electric utility group by 1/2 the expected growth so as to  
18 reflect growth over the coming year.

19 **Q. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE DCF MODEL.**

20 A. There is much debate as to the proper methodology to employ in estimating the growth

---

<sup>5</sup> *Petition for Modification of Prescribed Rate of Return*, Federal Communications Commission, Docket No. 79-05,

1 component of the DCF model. By definition, this component is investors' expectation of the long-term  
2 dividend growth rate. Presumably, investors use some combination of historic and/or projected growth  
3 rates for earnings and dividends per share and for internal or book value growth to assess long-term  
4 potential.

5 **Q. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE GROUP OF**  
6 **ELECTRIC UTILITY COMPANIES?**

7 A. I have analyzed a number of measures of growth for the electric utility companies. I calculated  
8 historic growth rates in sales, earnings, dividends, and book value per share growth rates for the  
9 companies in the group. I have reviewed *Value Line's* historic and projected growth rate estimates for  
10 earnings per share (EPS), dividends per share (DPS), and book value per share (BVPS). In addition,  
11 I have utilized earnings growth rate forecasts as provided by Zacks, Reuters, and First Call. These  
12 services solicit 5-year earning growth rate projections for securities analysts and compile and publish the  
13 averages of these forecasts on a monthly basis. They are readily available on the Internet. Finally, I  
14 have also assessed prospective growth as measured by prospective earnings retention rates and earned  
15 returns on common equity.

16 **Q. PLEASE DISCUSS HISTORIC GROWTH IN EARNINGS AND DIVIDENDS AS**  
17 **WELL AS INTERNAL GROWTH.**

18 A. Historic growth rates for EPS, DPS, and BVPS are readily available to virtually all investors  
19 and presumably an important ingredient in forming expectations concerning future growth. However,  
20 one must use historic growth numbers as measures of investors' expectations with caution. In some

---

Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62 (April 1980).

1 cases, past growth may not reflect future growth potential. Also, employing a single growth rate number  
2 (for example, for five or ten years), is unlikely to accurately measure investors' expectations due to the  
3 sensitivity of a single growth rate figure to fluctuations in individual firm performance as well as overall  
4 economic fluctuations (i.e., business cycles). However, one must appraise the context in which the  
5 growth rate is being employed. According to the conventional DCF model, the expected return on a  
6 security is equal to the sum of the dividend yield and the expected long-term growth in dividends.  
7 Therefore, to best estimate the cost of common equity capital using the conventional DCF model, one  
8 must look to long-term growth rate expectations.

9 Internally generated growth is a function of the percentage of earnings retained within the firm  
10 (the earnings retention rate) and the rate of return earned on those earnings (the return on equity). The  
11 internal growth rate is computed as the retention rate times the return on equity. Internal growth is  
12 significant in determining long-run earnings and, therefore, dividends. Investors recognize the  
13 importance of internally generated growth and pay premiums for stocks of companies that retain  
14 earnings and earn high returns on internal investments.

15 **Q. PLEASE SUMMARIZE YOUR ANALYSIS OF *VALUE LINE*'S HISTORIC AND**  
16 **PROJECTED GROWTH RATES FOR THE GROUP OF ELECTRIC UTILITY**  
17 **COMPANIES.**

18 A. Historic growth rates for the companies in the group, as published in the *Value Line*  
19 *Investment Survey*, are provide in Panel A, page 3 of Exhibit\_(JRW-6). Since historic growth is  
20 highly variable and subject to outliers, I am employing the median for analysis. Historic growth in EPS,  
21 DPS, and BVPS for the group ranges from 1.3% to 3.0%, with an average of 2.0%. Projections of

1 EPS, DPS, and BVPS growth are shown in Panel B. The average of these projections is 4.0%.  
2 Prospective internal growth of 4.3% is indicated, with *Value Line*'s average projected retention and  
3 equity return rates of 36.3% and 12.2%.

4 **Q. PLEASE ASSESS GROWTH FOR THE GROUP AS MEASURED BY ANALYSTS'**  
5 **FORECASTS OF EXPECTED 5-YEAR GROWTH IN EPS.**

6 A. Zacks, First Call, and Reuters collect, summarize, and publish Wall Street analysts' projected  
7 5-year EPS growth rate forecasts for companies. These forecasts are provided for the group of electric  
8 utility companies on page 4 of Exhibit\_(JRW-6). The average of these forecasts is 4.2%.

9 **Q. PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORIC AND**  
10 **PROSPECTIVE GROWTH OF THE GROUP OF ELECTRIC UTILITY COMPANIES.**

11 A. For the group of electric utility companies, historic indicators imply an average growth rate of  
12 2.0%. Projected and prospective internal growth rates for the group average are in the 4.0-4.5 percent  
13 range. Giving primary weight to the projected growth rate figures, an expected growth rate in the 4.0-  
14 4.5 percent range is reasonable for the group of electric utility companies. I will use the upper end of  
15 this range - 4.50% - as the expected growth rate for the electric utility group.

16 **Q. BASED ON THE ABOVE, ANALYSIS, WHAT IS YOUR INDICATED COMMON**  
17 **EQUITY COST RATE FROM THE DCF MODEL FOR THE GROUP?**

18 A. My DCF-derived equity cost rate for the group is:

19  
20  
21  
22 DCF Equity Cost Rate (k) =  $\frac{D_1}{P}$  + g  
23



Electric utility Companies  $4.20\% * 1.025 + 4.50\% = 8.79\%$

This result is summarized on page 1 of Exhibit\_(JRW-6).

### C. CAPITAL ASSET PRICING MODEL RESULTS

#### **Q. PLEASE DISCUSS THE CAPITAL ASSET PRICING MODEL (CAPM).**

A. The CAPM is a more general risk premium approach to gauging a firm's cost of equity capital. According to the risk premium approach, the cost of equity is the sum of the interest rate on a risk-free bond ( $R_f$ ) and a risk premium (RP), as in the following:

$$k = R_f + RP$$

The yield on long-term Treasury securities is normally used as  $R_f$ . Risk premiums are measured in different ways. The CAPM is a theory of the risk and expected returns of common stocks. In the CAPM, two types of risk are associated with a stock: firm-specific risk or unsystematic risk; and market or systematic risk, which is measured by a firm's beta. The only risk that investors receive a return for bearing is systematic risk.

According to the CAPM, the expected return on a company's stock, which is also the equity cost rate (K), is equal to:

$$K = (R_f) + \beta_{ibm} * [E(R_m) - (R_f)]$$

Where:

- 1 •  $K$  represents the estimated rate of return on the stock;
- 2 •  $E(R_m)$  represents the expected return on the overall stock market. Frequently, the ‘market’
- 3 refers to the S&P 500;
- 4 •  $(R_f)$  represents the risk-free rate of interest;
- 5 •  $[E(R_m) - (R_f)]$  represents the expected equity or market risk premium—the excess return that
- 6 an investor expects to receive above the risk-free rate for investing in risky stocks; and
- 7 •  $Beta$ —( $\beta_i$ ) is a measure of the systematic risk of an asset.
- 8 To estimate the required return or cost of equity using the CAPM requires three inputs: the risk-

9 free rate of interest ( $R_f$ ), the beta ( $\beta_i$ ), and the expected equity or market risk premium,  $[E(R_m) - (R_f)]$ .

10  $R_f$  is the easiest of the inputs to measure – it is the yield on long-term Treasury bonds.  $\beta_i$ , the measure  
11 of systematic risk, is a little more difficult to measure because there are different opinions about what  
12 adjustments, if any, should be made to historic betas due to their tendency to regress to 1.0 over time.  
13 And finally, an even more difficult input to measure is the expected equity or market risk premium,  
14  $[E(R_m) - (R_f)]$ . I will discuss each of these inputs, with most of the discussion focusing on the expected  
15 equity risk premium.

16 **Q. PLEASE DISCUSS EXHIBIT\_(JRW-7).**

17 A. Exhibit\_(JRW-7) provides the summary results for my CAPM study. Page 1 gives the results,  
18 and the following pages contain the supporting data.

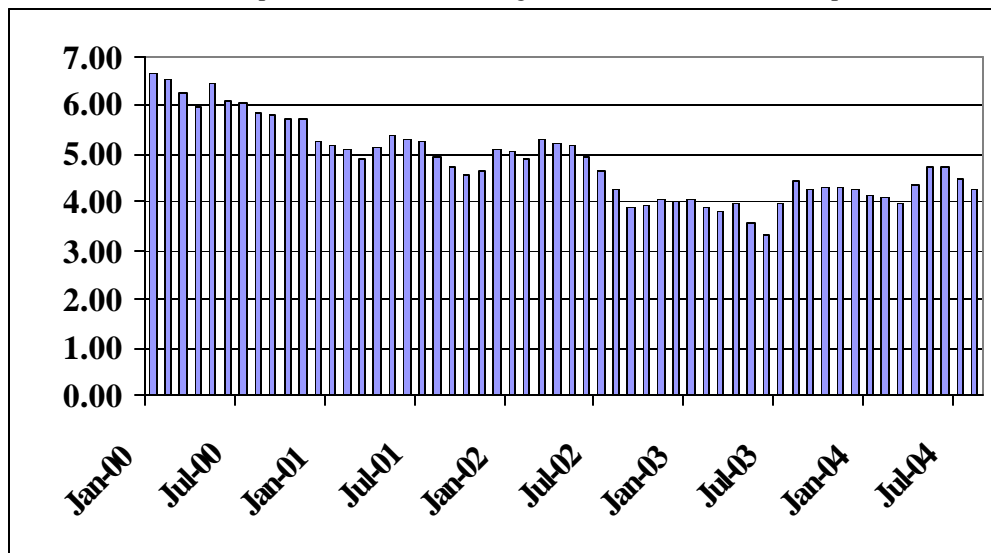
19 **Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE IN YOUR CAPM?**

20 A. The yield on long-term Treasury bonds has usually been viewed as the risk-free rate of interest  
21 in the CAPM. The yield on long-term Treasury bonds, in turn, was normally considered to be the yield  
22 on Treasuries with 30-year maturities. In recent years, the yield on 10-year Treasury bonds has been  
23 given more attention and, in some instances, replaced the yield on 30-year Treasury bonds as the  
24 benchmark long-term Treasury rate. This is because of light trading in the 30-year Treasury securities

as the supply declined in the late 1990s as the deficit dwindled. The 10-year Treasury yields over the past five years are shown in the chart below. These rates hit a 60-year low last summer at 3.33%. They increased with the rebounding economy to 4.75% in June of this year, but have since declined to the 4.0% range due primarily to concerns over the negative impact of higher energy prices on the economy.

### Ten-Year U.S. Treasury Yields January 2000-August 2004

Source: <http://www.federalreserve.gov/releases/h15/current/h15.pdf>



However, with the return of deficit financing by the U.S. Government in the wake of a recession, 9/11, and the Iraq War, the supply 30-year Treasuries has increased and once again the 30-year Treasury yield receives more attention as the long-term Treasury borrowing rate.

### U.S. Treasury Yields September 23, 2004

Source: [http://online.wsj.com/page/mdc/0,,2\\_0501-databank-1,00.html](http://online.wsj.com/page/mdc/0,,2_0501-databank-1,00.html)

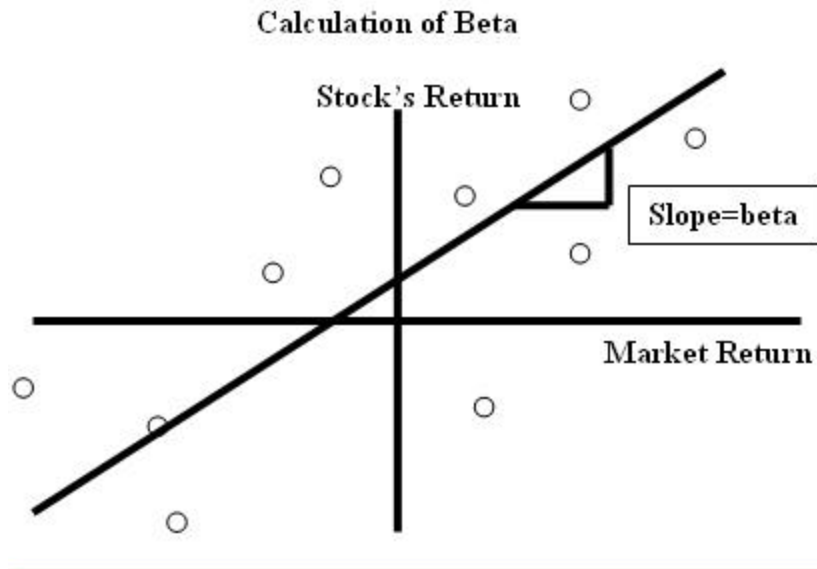
Treasury Securities	Change	Yield%
Two-Year Note <sup>o</sup>	Unch.	2.460%
Five-Year Note <sup>o</sup>	-1/32	3.250
Ten-Year Note <sup>o</sup>	Unch.	3.980
30-Year Bond <sup>o</sup>	-1/32	4.780

**Q. GIVEN THIS DISCUSSION, WHAT RISK-FREE INTEREST RATE DO YOU EMPLOY IN YOUR CAPM?**

A. Given the recent and current Treasury yields, and the issues regarding the appropriate long-term U.S. Treasury yield, I will use 4.50% as the risk-free rate, or  $R_f$ , in my CAPM.

**Q. WHAT BETAS ARE YOU EMPLOYING FOR THE ELECTRIC UTILITY GROUP IN YOUR CAPM?**

A. Beta ( $\beta$ ) is a measure of the systematic risk of a stock. The market, usually taken to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price movement as the market also has a beta of 1.0. A stock whose price movement is greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below average price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return as in the following:



The slope of the regression line is the stock's  $\beta$ . A steeper line indicates the stock is more sensitive to the return on the overall market. This means that the stock has a higher  $\beta$  and greater than average market risk. A less steep line indicates a lower  $\beta$  and less market risk.

Numerous online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to (1) the time period over which the  $\beta$  is measured and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time. In estimating an equity cost rate for CVPS, I am using the average betas for the companies in the electric utility group as provided in the *Value Line Investment Survey*. As shown on page 2 of Exhibit\_(JRW-7), this average is 0.76.

**Q. PLEASE DISCUSS THE DEBATE REGARDING THE EQUITY RISK PREMIUM.**

A. The equity or market risk premium— $[E(R_m) - R_f]$ : is equal to the expected return on the stock market (e.g., the expected return on the S&P 500 ( $E(R_m)$ )) minus the risk-free rate of interest ( $R_f$ ). The

equity premium is the difference in the expected total return between investing in equities and investing in “safe” fixed-income assets, such as long-term government bonds. However, while the equity risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market.

**Q. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING THE EQUITY RISK PREMIUM.**

A. The table below highlights the primary approaches to, and issues in, estimating the expected equity risk premium. The traditional way to measure the equity risk premium was to use the difference between historic average stock and bond returns. In this case, historic stock and bond returns, also called ex post returns, were used as the measures of the market’s expected return (known as the ex ante or forward-looking expected return). This type of historic evaluation of stock and bond returns is often called the “Ibbotson approach” after Professor Roger Ibbotson who popularized this method of using historic financial market returns as measures of expected returns. Most historic assessments of the equity risk premium suggest an equity risk premium of 5-7 percent above the rate on long-term Treasury bonds. However, this can be a problem because (1) ex post returns are not the same as ex ante expectations, (2) market risk premiums can change over time, increasing when investors become more risk-averse, and decreasing when investors become less risk-averse, and (3) market conditions can change such that ex post historic returns are poor estimates of ex ante expectations.

**Risk Premium Approaches**

	Historical Ex Post Excess Returns	Surveys	Ex Ante Models and Market Data
<b>Means of Assessing the Equity-Bond Risk Premium</b>	Historical average is a popular proxy for the ex ante premium – but likely to be misleading	Investor and expert surveys can provide direct estimates of prevailing expected returns/premiums	Current financial market prices (simple valuation ratios or DCF-based measures) can give most objective estimates of feasible ex ante equity-bond risk premium
<b>Problems/Debated Issues</b>	Time variation in required returns and systematic selection and other biases have boosted valuations over time, and have exaggerated realized excess equity returns compared with ex ante expected premiums	Limited survey histories and questions of survey representativeness.  Surveys may tell more about hoped-for expected returns than about objective required premiums due to irrational biases such as extrapolation.	Assumptions needed for DCF inputs, notably the trend earnings growth rate, make even these models' outputs subjective.  The range of views on the growth rate, as well as the debate on the relevant stock and bond yields, leads to a range of premium estimates.

Source: Antti Ilmanen, "Expected Returns on Stocks and Bonds," *Journal of Portfolio Management*, (Winter 2003).

The traditional way to measure the equity risk premium was to use the difference between historic average stock and bond returns. In this case, historic stock and bond returns, also called ex post returns, were used as the measures of the market's expected return (known as the ex ante or forward-looking expected return). This type of historic evaluation of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson who popularized this method of using historic financial market returns as measures of expected returns. Most historic assessments of the equity risk premium suggest an equity risk premium of 5-7 percent above the rate on long-term Treasury bonds. However, this can be a problem because (1) ex post returns are not the same as ex ante expectations, (2) market risk premiums can change over time, increasing when investors become more risk-averse, and decreasing when investors become less risk-averse, and (3) market conditions can change such that ex post historic returns are poor estimates of ex ante expectations.

The use of historic returns as market expectations has been criticized in numerous academic

1 studies.<sup>6</sup> The general theme of these studies is that the large equity risk premium discovered in historic  
2 stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the  
3 category “Ex Ante Models and Market Data,” compute ex ante expected returns using market data to  
4 arrive at an expected equity risk premium. These studies have also been called “Puzzle Research” after  
5 the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historic  
6 equity risk premiums relative to fundamentals.<sup>7</sup>

7 **Q. PLEASE BRIEFLY SUMMARIZE SOME OF THE NEW ACADEMIC STUDIES**  
8 **THAT DEVELOP EX ANTE EQUITY RISK PREMIUMS.**

9 A. Two of the most prominent studies of ex ante expected equity risk premiums were by Eugene  
10 Fama and Ken French (2002) and James Claus and Jacob Thomas (2001). The primary debate in  
11 these studies revolves around two related issues: (1) the size of expected equity risk premium, which is  
12 the return equity investors require above the yield on bonds; and (2) the fact that estimates of the ex  
13 ante expected equity risk premium using fundamental firm data (earnings and dividends) are much lower  
14 than estimates using historic stock and bond return data. Fama and French (2002), two of the most  
15 preeminent scholars in finance, use dividend and earnings growth models to estimate expected stock  
16 returns and ex ante expected equity risk premiums.<sup>8</sup> They compare these results to actual stock returns  
17 over the period 1951-2000. Fama and French estimate that the expected equity risk premium from  
18 DCF models using dividend and earnings growth to be between 2.55% and 4.32%. These figures are

---

<sup>6</sup> The problems with using ex post historic returns as measure of ex ante expectation will be discussed at length later in my testimony.

<sup>7</sup> Rahnish Mehra and Edward Prescott, “The Equity Premium: A Puzzle,” *Journal of Monetary Economic* (1985).



1 much lower than the ex post historic equity risk premium produced from the average stock and bond  
2 return returns over the same period, which is 7.40%.

3 Fama and French conclude that the ex ante equity risk premium estimates using DCF models  
4 and fundamental data are superior to those using ex post historic stock returns for three reasons: (1) the  
5 estimates are more precise (a lower standard error); (2) the Sharpe ratio, which is measured as the  
6  $[(\text{expected stock return} - \text{risk-free rate})/\text{standard deviation}]$ , is constant over time for the DCF models  
7 but more than doubles for the average stock-bond return model; and (3) valuation theory specifies  
8 relationships between the market-to-book ratio, return on investment, and cost of equity capital that  
9 favor estimates from fundamentals. They also conclude that the high average stock returns over the  
10 past 50 years were the result of low expected returns and that the average equity risk premium has been  
11 in the 3-4 percent range.

12 The study by Claus and Thomas of Columbia University provides direct support for the findings  
13 of Fama and French.<sup>9</sup> These authors compute ex ante expected equity risk premiums over the 1985-  
14 1998 period by (1) computing the discount rate that equates market values with the present value of  
15 expected future cash flows, and (2) then subtracting the risk-free interest rate. The expected cash flows  
16 are developed using analysts' earnings forecasts. The authors conclude that over this period the ex ante  
17 expected equity risk premium is in the range of 3.0%. Claus and Thomas note that, over this period, ex  
18 post historic stock returns overstate the ex ante expected equity risk premium because as the expected  
19 equity risk premium has declined, stock prices have risen. In other words, from a valuation perspective,

---

<sup>8</sup> Eugene F. Fama and Kenneth R. French, "The Equity Premium," *The Journal of Finance*, April 2002. This paper may be downloaded from the Internet at: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=236590](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=236590).

1 the present value of expected future returns increase when the required rate of return decreases. The  
2 higher stock prices have produced stock returns that have exceeded investors' expectations and  
3 therefore ex post historic equity risk premium estimates are biased upwards as measures of ex ante  
4 expected equity risk premiums.

5 **Q. PLEASE PROVIDE A SUMMARY OF THE EX ANTE EQUITY RISK PREMIUM**  
6 **STUDIES.**

7 A. Richard Derrig and Elisha Orr (2003) recently completed the most comprehensive paper to  
8 date which summarizes and assesses the many risk premium studies.<sup>10</sup> Appendix B of their study, which  
9 provides summary statistics for the different studies, is included as pages 2 and 3 of Exhibit\_(JRW-8).  
10 The risk premium studies listed under the 'Social Security' and 'Puzzle Research' sections are primarily  
11 ex ante expected equity risk premium studies. Most of these studies are performed by leading  
12 academic scholars in finance and economics. A review of the 'ERP Estimate' column in Appendix B of  
13 the Derrig and Orr study suggests that the average ex ante equity risk premium estimate is in the 4.0%  
14 range.

15 **Q. GIVEN THIS BACKGROUND INFORMATION, HOW WILL YOU ESTIMATE AN**  
16 **EQUITY RISK PREMIUM FOR YOUR CAPM?**

17 A. My equity risk premium is the average of: (1) the 4.0% average ex ante expected equity risk  
18 premiums from the studies covered in the Derrig and Orr (2003) study, and (2) an ex ante expected

---

<sup>9</sup> James Claus and Jacob Thomas, "Equity Risk Premia as Low as Three Percent? Empirical Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Market," *Journal of Finance*. (October 2001).

<sup>10</sup> Richard Derrig and Elisha Orr, "Equity Risk Premium: Expectations Great and Small," Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, August 28, 2003.

equity risk premium developed using Ibbotson and Chen's "building blocks methodology."

**Q. PLEASE DISCUSS THE EX ANTE EXPECTED EQUITY RISK PREMIUM  
COMPUTED USING THE "BUILDING BLOCKS METHODOLOGY."**

A. Ibbotson and Chen (2002) evaluate the ex post historic mean stock and bond returns in what is called a "building blocks methodology."<sup>11</sup> They use 75 years of data and relate the compounded historic returns to the different fundamental variables employed by different researchers in building ex ante expected equity risk premiums. Among the variables included were inflation, real EPS and DPS growth, ROE and book value growth, and P/E ratios. By relating the fundamental factors to the ex post historic returns, the methodology bridges the gap between the ex post and ex ante equity risk premiums.

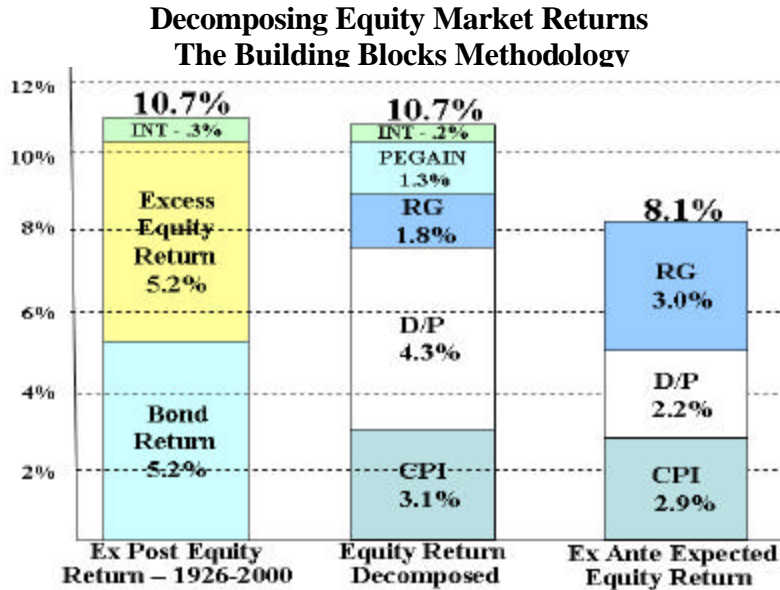
Ilmanen (2003) illustrates this approach using the geometric returns and five fundamental variables – inflation (CPI), dividend yield (D/P), real earnings growth (RG), repricing gains (PEGAIN) and return interaction/reinvestment (INT).<sup>12</sup> This is shown in the graph below. The first column breaks the 1926-2000 geometric mean stock return of 10.7% into the different return components demanded by investors: the historic Treasury bond return (5.2%), the excess equity return (5.2%), and a small interaction term (0.3%). This 10.7% annual stock return over the 1926-2000 period can then be broken down into the following fundamental elements: inflation (3.1%), dividend yield (4.3%), real earnings growth (1.8%), repricing gains (1.3%) associated with higher P/E ratios, and a small interaction

---

<sup>11</sup> Roger Ibbotson and Peng Chen, "Long Run Returns: Participating in the Real Economy," *Financial Analysts Journal*, January 2003.

<sup>12</sup> Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio Management*, (Winter 2003), p. 11.

term (0.2%).



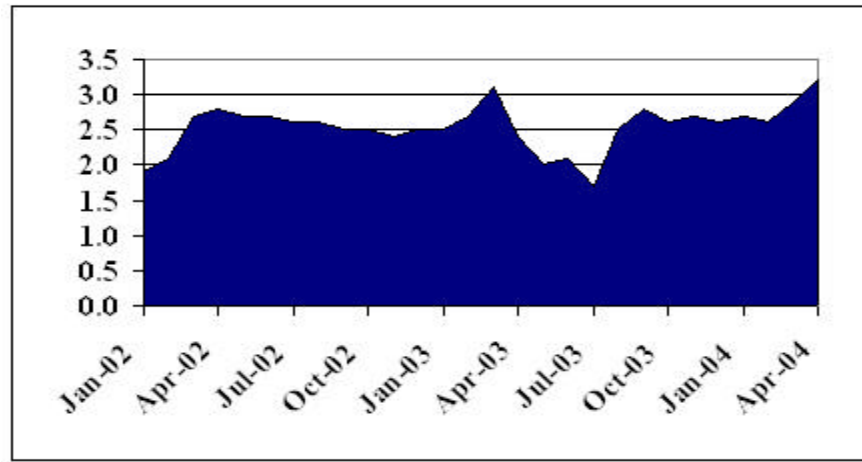
**Q. HOW ARE YOU USING THIS METHODOLOGY TO DERIVE AN EX ANTE EXPECTED EQUITY RISK PREMIUM?**

A. The third column in the graph above shows current inputs to estimate an ex ante expected market return. These inputs include the following:

CPI – To assess expected inflation, I have employed expectations of the short-term and long-term inflation rate. The graph below shows the expected annual inflation rate according to consumers, as measured by the CPI, over the coming year. This survey is published monthly by the University of Michigan Survey Research Center. In the most recent report, expected one-year ahead inflation rate was 3.3%.

**Expected Inflation Rate  
University of Michigan Consumer Research**

(Data Source: <http://research.stlouisfed.org/fred2/series/MICH/98>)



Longer term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's publication entitled *Survey of Professional Forecasters*.<sup>13</sup> This survey of professional economists has been published for almost 50 years. While this survey is published quarterly, only the first quarter survey includes long-term forecasts of GDP growth, inflation, and market returns. In the first quarter, 2004 survey, published on February 23, 2004, the median long-term (10-term) expected inflation rate as measured by the CPI was 2.50% (see page 4 of Exhibit\_(JRW-8)).

Given these results, I will use the average of the University of Michigan and Philadelphia Federal Reserve's surveys (3.30% and 2.50%), or 2.90%.

D/P – As shown in the graph below, the dividend yield on the S&P 500 has decreased gradually over the past decade. Today, it is far below its norm of 4.3% over the 1926-2000 time

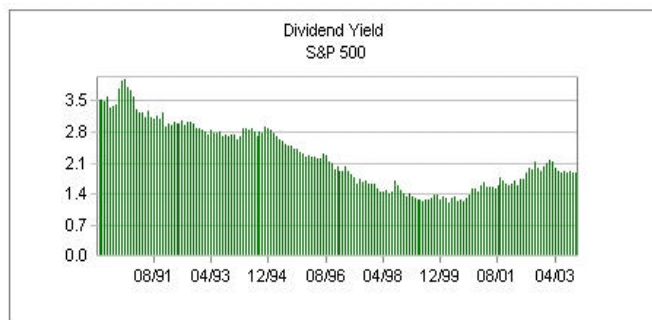
---

<sup>13</sup>Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters*, February 23, 2004. The *Survey of Professional Forecasters* was formerly conducted by the American Statistical Association (ASA) and the National Bureau of Economic Research (NBER) and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

period. Whereas the S&P dividend yield bottomed out at less than 1.4% in 2000, it is currently at 2.2% which I use in the ex ante risk premium analysis.

### S&P 500 Dividend Yield

(Data Source: [http://www.barra.com/Research/fund\\_charts.asp](http://www.barra.com/Research/fund_charts.asp))



RG – To measure expected real growth in earnings, I use (1) the historic real earnings growth rate for the S&P 500, and (2) expected real GDP growth. The S&P 500 was created in 1960. It includes 500 companies which come from ten different sectors of the economy. Over the 1960-2003 period, nominal growth in EPS for the S&P 500 was 6.88%. On page 5 of Exhibit\_(JRW-8), real EPS

1 growth is computed using the CPI as a measure of inflation. As indicated by Ibbotson and Chen, real  
2 earnings growth over the 1926-2000 period was 1.8%. The real growth figure over 1960-2003 period  
3 for the S&P 500 is 2.5%.

4 The second input for expected real earnings growth is expected real GDP growth. The  
5 rationale is that over the long-term, corporate profits have averaged a relatively consistent 5.50% of US  
6 GDP.<sup>14</sup> Real GDP growth, according to McKinsey, has averaged 3.5% over the past 80 years.  
7 Expected GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey of*  
8 *Professional Forecasters*, is 3.4% (see page 4 of Exhibit\_(JRW-8)).

9 Given these results, I will use the average of the historic S&P EPS real growth and the historic  
10 real GDP growth (and as supported by the Philadelphia Federal Reserve survey of expected GDP  
11 growth) (2.5% and 3.5%), or 3.0%, for real earnings growth.

12 PEGAIN – the repricing gains associated with increases in the P/E ratio accounted for 1.3% of  
13 the 10.7% annual stock return in the 1926-2000 period. In estimating an ex ante expected stock  
14 market return, one issue is whether investors expect P/E ratios to increase from their current levels. The  
15 graph below shows the P/E ratios for the S&P 500 over the past 25 years. The run-up and eventual  
16 peak in P/Es is most notable in the chart. The relatively low P/E ratios (in the range of 10) over two  
17 decades ago are also quite notable. As of August, 2004 the P/E for the S&P 500, using the trailing 12  
18 months EPS, is in the range of 21.0 to 22.0 according to [www.investor.reuters.com](http://www.investor.reuters.com).

19 Given the current economic and capital markets environment, I do not believe that investors

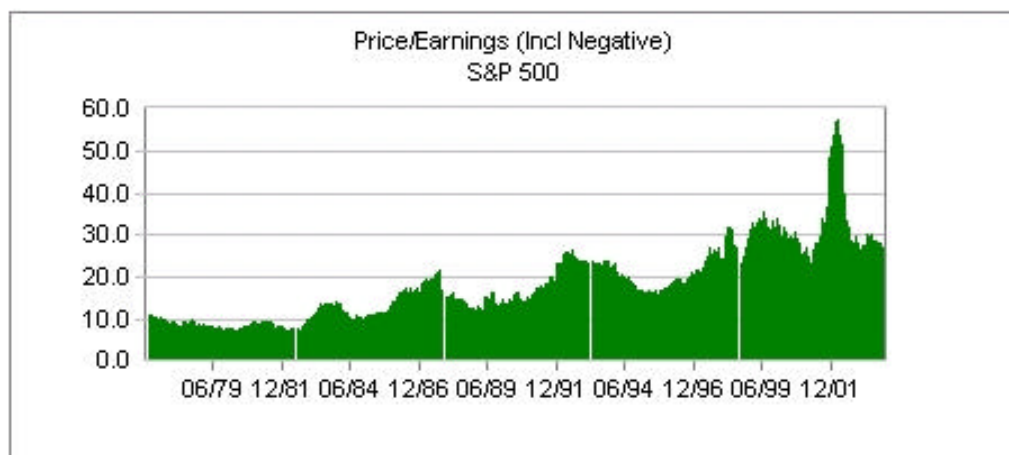
---

<sup>14</sup>Marc H. Goedhart, Timothy M. Koller, and Zane D. Williams, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.14. Available at <http://www.corporatefinance.mckinsey.com/>.

1 expect even higher P/E ratios. Therefore, a PEGAIN would not be appropriate in estimating an ex ante  
2 expected stock market return. There are two primary reasons for this. First, the average historic S&P  
3 500 P/E ratio is 15 – thus the current P/E exceeds this figure by nearly 50%. Second, as previously  
4 noted, interest rates are at a cyclical low not seen in almost 50 years. This is a primary reason for the  
5 high current P/Es. Given the current market environment with relatively high P/E ratios and low relative  
6 interest rate, investors are not likely to expect to get stock market gains from lower interest rates and  
7 higher P/E ratios.

#### 8 **S&P 500 P/E Ratios**

9 (Data Source: [http://www.barra.com/Research/fund\\_charts.asp](http://www.barra.com/Research/fund_charts.asp))



10  
11  
12 **Q. GIVEN THIS DISCUSSION, WHAT IS YOUR EX ANTE EXPECTED MARKET**  
13 **RETURN AND EQUITY RISK PREMIUM USING THE “BUILDING BLOCKS**  
14 **METHODOLOGY”?**

15 **A.** My expected market return is represented by the last column on the right in the graph entitled  
16 “Decomposing Equity Market Returns: The Building Blocks Methodology” found earlier in my



1 testimony. I believe that the appropriate expected market return is 8.1% which is composed of 2.90%  
2 expected inflation, 2.20% dividend yield, and 3.00% real earnings growth rate.

3 **Q. GIVEN THAT THE HISTORIC COMPOUNDED ANNUAL MARKET RETURN IS**  
4 **IN EXCESS OF 10%, WHY DO YOU BELIEVE THAT YOUR EXPECTED MARKET**  
5 **RETURN OF 8.1% IS REASONABLE?**

6 A. As discussed above in the development of the expected market return, stock prices are  
7 relatively high at the present time in relation to earnings and dividends and interest rates are relatively  
8 low. Hence, it is unlikely that investors are going to experience high stock market returns due to higher  
9 P/E ratios and/or lower interest rates. In addition, as shown in the decomposition of equity market  
10 returns, whereas the dividend portion of the return was historically 4.3%, the current dividend yield is  
11 only 2.2%. Due to these reasons, lower market returns are expected for the future.

12 **Q. IS YOUR EXPECTED MARKET RETURN OF 8.1% CONSISTENT WITH THE**  
13 **FORECASTS OF MARKET PROFESSIONALS?**

14 A. Yes. The only survey of market professionals dealing with forecasts of stock market returns is  
15 published by the previously-referenced Federal Reserve Bank of Philadelphia. In the first quarter, 2004  
16 survey, published on February 23, 2004, the median long-term expected return on the S&P 500 was  
17 7.75% (see page 5 of Exhibit\_(JRW-8)). This is clearly consistent with my expected market return of  
18 8.1%.

19 **Q. GIVEN THIS EXPECTED MARKET RETURN, WHAT IS YOUR EX ANTE**  
20 **EQUITY RISK PREMIUM USING THE “BUILDING BLOCKS METHODOLOGY”?**

1 A. Previously I noted that I am using a risk-free interest rate of 4.50%. My ex ante equity risk  
2 premium is simply the expected market return from the “building blocks methodology” minus this risk-  
3 free rate:

$$4 \quad \text{Ex Ante Equity Risk Premium} \quad = \quad 8.10\% \quad - \quad 4.50\% \quad = \quad 3.60\%$$

5 **Q. WHAT EQUITY RISK PREMIUM ARE YOU USING IN YOUR CAPM?**

6 A. I am employing the average of the Derrig-Orr mean (4.00%) and my building blocks approach  
7 (3.60%), or 3.80%.

8 **Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE**  
9 **EQUITY RISK PREMIUMS OF LEADING INVESTMENT FIRMS?**

10 A. Yes. One of the first studies in this area was by Stephen Einhorn, one of Wall Street’s leading  
11 investment strategists.<sup>15</sup> His study showed that the market or equity risk premium had declined to the  
12 2.0 to 3.0 percent range by the early 1990s. Among the evidence he provided in support of a lower  
13 equity risk premium is the inverse relationship between real interest rates (observed interest rates minus  
14 inflation) and stock prices. He noted that the decline in the market risk premium has led to a significant  
15 change in the relationship between interest rates and stock prices. One implication of this development  
16 was that stock prices had increased higher than would be suggested by the historic relationship between  
17 valuation levels and interest rates.

18 The equity risk premiums of some of the other leading investment firms today support the result  
19 of the academic studies. An article in *The Economist* indicated that some other firms like J.P. Morgan

---

<sup>15</sup> Steven G. Einhorn, “The Perplexing Issue of Valuation: Will the Real Value Please Stand Up?” *Financial Analysts Journal* (July-August 1990), pp. 11-16.

are estimating an equity risk premium for an average risk stock in the 2.0 to 3.0 percent range above the interest rate on U.S. Treasury bonds.<sup>16</sup>

**Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS USED BY CORPORATE CHIEF FINANCIAL OFFICERS (CFOs)?**

A. Yes. John Graham and Campbell Harvey of Duke University survey CFOs to ascertain their ex ante equity risk premium. In Graham and Harvey's 2003 survey, the average ex ante 10-year equity risk premium of the CFOs was 3.8%.<sup>17</sup>

**Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EX ANTE EQUITY RISK PREMIUMS OF PROFESSIONAL FORECASTERS?**

A. Yes. The financial forecasters in the previously-referenced Federal Reserve Bank of Philadelphia survey project both stock and bond returns. As shown on page 5 of Exhibit\_(JRW-8)), the median long-term expected stock and bond returns were 7.75% and 5.25%, respectively. This provides an ex ante equity risk premium of 2.50%.

**Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS USED BY THE LEADING CONSULTING FIRMS?**

A. Yes. McKinsey & Co. is widely recognized as the leading management consulting firm in the world. They recently published a study entitled "The Real Cost of Equity" in which they developed an

---

<sup>16</sup> For example, see "Welcome to Bull Country," *The Economist* (July 18, 1998), pp. 21-3, and "Choosing the Right Mixture," *The Economist* (February 27, 1999), pp. 71-2.

<sup>17</sup> John R. Graham and Campbell Harvey, "Expectations of Equity Risk Premia, Volatility, and Asymmetry," Duke

ex ante equity risk premium for the US. In reference to the decline in the equity risk premium, as well as what is the appropriate equity risk premium to employ for corporate valuation purposes, the McKinsey authors concluded the following:

We attribute this decline not to equities becoming less risky (the inflation-adjusted cost of equity has not changed) but to investors demanding higher returns in real terms on government bonds after the inflation shocks of the late 1970s and early 1980s. We believe that using an equity risk premium of 3.5 to 4 percent in the current environment better reflects the true long-term opportunity cost of equity capital and hence will yield more accurate valuations for companies.<sup>18</sup>

**Q. WHAT EQUITY COST RATE IS INDICATED BY YOUR CAPM ANALYSIS?**

A. This is summarized on page 1 of Exhibit\_(JRW-8). Using a risk-free rate of 4.50% and a beta of 0.74 for the group of electric utility companies, my CAPM estimated equity cost rates is 7.31%.

Electric utility Companies	$4.50\% * 0.76 * 3.80\%$	$=$	7.39%
----------------------------	--------------------------	-----	-------

**D. EQUITY COST RATE SUMMARY**

**Q. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.**

A. My DCF and CAPM analyses for the group of electric utility companies indicate equity cost rates of 8.89% and 7.39%.

**Q. GIVEN THESE RESULTS, WHAT EQUITY COST RATE RECOMMENDATION ARE YOU MAKING FOR CVPS?**

---

University Working Paper, 2003.

<sup>18</sup>Marc H. Goedhart, Timothy M. Koller, and Zane D. Williams, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.15. Available at <http://www.corporatefinance.mckinsey.com/>.

1 A. Since I primarily employ the DCF model to estimate an equity cost rate, I am recommending the  
2 DCF equity cost rate of 8.75% for CVPS.

3 **Q. ISN'T YOUR RECOMMENDED RETURN LOW BY HISTORIC STANDARDS?**

4 A. Yes it is, and appropriately so. My recommended rate of return is low by historic standards for  
5 three reasons. First, as discussed above, current capital costs are very low by historic standards, with  
6 interest rates at a cyclical low not seen since the 1960s. Second, the 2003 tax law, which reduces the  
7 tax rates on dividend income and capital gains, lowers the pre-tax return required by investors. And  
8 third, as discussed below, the equity or market risk premium has declined.

9 **Q. FINALLY, PLEASE DISCUSS THIS RECOMMENDATION IN LIGHT OF**  
10 **RECENT YIELDS ON 'A' RATED PUBLIC UTILITY BONDS AND CVPS'S EMBEDDED**  
11 **COST OF LONG-TERM DEBT.**

12 A. In recent months the yields on 'A' rated public utility bonds have been in the 6.0 percent range.  
13 In addition, CVPS's embedded long-term debt cost rate is 5.77%. My equity return recommendation  
14 of 8.75% may appear to be too low given these yields. However, my recommendation must be viewed  
15 in the context of the significant decline in the market or equity risk premium. As a result, the return  
16 premium that equity investors require over bond yields is much lower than today. This decline was  
17 previously reviewed in my discussion of capital costs in today's markets. In addition, it will be examined  
18 in more depth in my critique of Mr. Cater's testimony

19 In terms of CVPS's embedded cost of long-term debt, it must be remembered that this cost  
20 rate is an embedded cost rate and reflects debt that was issued in the past at somewhat higher interest  
21 rates. Therefore, it is not appropriate to compare the embedded debt cost rate with the current equity

1 cost rate.

2 **Q. HOW DO YOU TEST THE REASONABLENESS OF YOUR 8.75%**  
3 **RECOMMENDATION?**

4 A. To test the reasonableness of my 8.75% recommendation, I have examined the relationship  
5 between the return on common equity and the market-to-book ratios for the group of electric utility  
6 companies.

7 **Q. WHAT DO THE RETURNS ON COMMON EQUITY AND MARKET-TO-BOOK**  
8 **RATIOS FOR THE GROUP INDICATE ABOUT THE REASONABLENESS OF YOUR**  
9 **8.75% RECOMMENDATION?**

10 A. Exhibit\_(JRW-3) provides financial performance and market valuation statistics for the electric  
11 utility companies. The average current return on equity and market-to-book ratio for the group are  
12 12.0% and 1.84, respectively. These results clearly indicate that, on average, these companies are  
13 earning returns on equity significantly above their equity cost rates. As such, this observation provides  
14 evidence that my recommended equity cost rate of 8.75% is reasonable and fully consistent with the  
15 financial performance and market valuation of the electric utility companies.

16  
17  
18 **V. CRITIQUE OF CVPS'S RATE OF RETURN TESTIMONY**  
19

20 **Q. BEFORE REVIEWING MR. CATER'S REQUIRED RETURN ON EQUITY**  
21 **STUDIES, PLEASE ADDRESS HIS ASSERTIONS REGARDING THE RISKINESS OF**

1 **CVPS.**

2 A. Mr. Cater claims that there are major company-specific risks confronted by CVPS. These  
3 include: (1) lack of a power-cost adjustment clause (“PCA”); (2) cost volatility related to the New  
4 England Standard Market Design (“SMD”) rules; (3) perceptions of some in the investment community  
5 that Vermont is a difficult jurisdiction for utilities to function in; (4) incomplete implementation of  
6 Performance Based Ratemaking (“PBR”); and (5) discontinuation of the Account Correcting for  
7 Efficiency (“ACE”) mechanism for recovery of lost revenues associated with so-called “system-wide”  
8 demand side management (“DSM”) programs.

9 **Q. PLEASE COMMENT ON THESE ASSERTIONS.**

10 A. I have two primary issues with these assertions. First, Mr. Cater can only provide anecdotal  
11 evidence regarding these risk factors. He does not provide any empirical evidence that the factors are  
12 significant enough to increase the risk of CVPS relative to other electric utilities. Second, whereas Mr.  
13 Cater believes that these factors uniquely increase CVPS’s risk profile, the debt rating agencies  
14 apparently do not. In response to DPS Date Request No. 4-16, Mr. Cater provided copies of all  
15 rating agency reports of CVPS published in the last two years. The risk factors highlighted by Mr.  
16 Cater receive very little, if any, attention by the rating agencies. For example, the Moody’s report,  
17 dated June 3, 20004, lists the credit strengths of CVPS as (1) Vermont Public Service Board support  
18 for supply cost recovery, the sale of Vermont Yankee, cost-conscious strategy improving financial  
19 results, and a focus on maintaining adequate capitalization ratios. The credit challenges are CVPS’s  
20 capital investments required to enhance transmission infrastructure, the nonutility businesses weakens the  
21 business risk profile, and the fact that utility rates are higher than the regional average. Furthermore, in

contrast to Mr. Cater, several of the reports noted the positive effect of various regulatory actions on CVPS.

**Q. DO YOU HAVE ANY OTHER OBSERVATIONS ON THE RISKINESS OF CVPS?**

A. Yes. As noted in the previous discussion regarding CVPS's capital structure, the company has a much higher common equity ratio than other electric utilities. As such, the Company is subject to much less financial risk. Furthermore, from a business risk perspective (and as highlighted in the credit reports), the Company's customer mix is diverse which helps CVPS's stable utility segment to generate consistent cash flow.

**Q. PLEASE REVIEW MR. CATER'S EQUITY COST RATE APPROACHES.**

A. Mr. Cater estimates an equity cost rate of 11.00% for CVPS by applying CAPM, RP, and DCF models to the group of electric utility companies. These results are summarized below:

**Summary of Approaches and Results**

	<u>Equity Cost Rate</u>
CAPM	
Traditional	11.25%
ECAPM	11.73%
Risk Premium	9.54%
DCF	9.48%

**Q. WHAT CONCERNS DO YOU HAVE WITH MR. CATER'S ANALYSES.**

A. I have three concerns with Mr. Cater's CAPM analyses: (1) his risk-free interest rate of 6.00%, (2) his use of the so-called empirical CAPM (ECAPM), and (3) most significantly, his equity or market risk premium.

**Q. PLEASE ADDRESS THE RISK-FREE INTEREST RATE IN MR. CATER'S CAPM**



1   **ANALYSIS.**

2   A.     Mr. Cater has utilized a risk-free interest rate of 6.00%, which he obtained from the *Bluechip*  
3   *Report*. There are two problems with is risk-free rate. First, in DPS Date Request No. 4-9, Mr. Cater  
4   was asked to provide copies of all studies that demonstrate the accuracy of the forecasts obtained from  
5   the *Bluechip Report*. In response, he indicated that he was unaware of any such studies. Given the  
6   lack of documentation regarding the accuracy of such forecasts, it is hard to believe that they represent  
7   the expectation of the market. Second, in contrast to Mr. Cater's presumption that interest rates would  
8   increase, long-term interest rates have actually declined and now the current 30-year Treasury rate is  
9   below 4.80%. Given these two problems, Mr. Cater's risk-free interest rate of 6.00% is clearly  
10   excessive.

11   **Q.     WHAT ISSUES DO YOU HAVE WITH MR. CATER'S ECAPM?**

12   A.     Mr. Cater has employed not only a traditional CAPM, but also a variation of the CAPM which  
13   he calls the 'ECAPM.' In DPC Data Request No. 4-10, Mr. Cater was asked to provide copies of  
14   empirical studies that support the weights used in the EACPM. In response, Mr. Cater provided a  
15   chapter from a book by Dr. Roger Morin that describes this approach but does not empirically test it.  
16   This response does not justify Mr. Cater's use of the ECAPM in this case. Mr. Cater has not provided  
17   copies of studies published in refereed journals to support the ECAPM. In addition, the results  
18   presented in Dr. Morin's book does not necessarily support the ECAPM used by Mr. Cater. For  
19   example, Dr. Morin's results are also consistent with a declining equity risk premium over time.

20   **Q.     YOUR THIRD ISSUE WITH MR. CATER'S CAPM INVOLVES THE EQUITY**  
21   **RISK PREMIUM. WHAT IS YOUR CONCERN ON THIS MATTER?**

1 A. The primary problem with Mr. Cater's CAPM is his equity or market risk premium. Mr. Cater  
2 has employed historic stock and bond returns to compute an expected or ex ante equity risk premium of  
3 7.19%. He employs this risk premium in both his CAPM and ECAPM analyses.

4 There are a number of biases in using historic return data to measure expected required returns  
5 and equity risk premiums. Mr. Cater computes the equity risk premium as the difference between  
6 historic stock returns and historic government bond returns over the 1926-2003 time period using the  
7 data and methodology of Roger Ibbotson who popularized this method of assessing historic financial  
8 market returns.

9 **Q. PLEASE DISCUSS THE USE OF HISTORIC RETURNS TO COMPUTE A**  
10 **FORWARD-LOOKING OR EX ANTE RISK PREMIUM.**

11 A. Using the historic relationship between stock and bond returns to measure an ex ante equity risk  
12 premium is erroneous and, especially in this case, overstates the true market equity risk premium. The  
13 equity risk premium is based on expectations of the future and when past market conditions vary  
14 significantly from the present, historic data does not provide a realistic or accurate barometer of  
15 expectations of the future. At the present time, using historic returns to measure the ex ante equity risk  
16 premium ignores current market conditions and masks the dramatic change in the risk and return  
17 relationship between stocks and bonds. This change suggests that the equity risk premium has declined.

18  
19 **Q. PLEASE DISCUSS THE ERRORS IN USING HISTORIC STOCK AND BOND**  
20 **RETURNS TO ESTIMATE AN EX ANTE EQUITY RISK PREMIUM.**

21 A. There are a number of flaws in using historic returns over long time periods to estimate expected

equity risk premiums. These issues include:

- (A) Biased historic bond returns;
- (B) The arithmetic versus the geometric mean return;
- (C) Unattainable and biased historic stock returns;
- (D) Survivorship bias;
- (E) The “Peso Problem;”
- (F) Market conditions today are significantly different than the past; and
- (G) Changes in risk and return in the markets.

These issues will be addressed in order.

#### **Biased Historic Bond Returns**

##### **Q. HOW ARE HISTORIC BOND RETURNS BIASED?**

A. An essential assumption of these studies is that over long periods of time investors’ expectations are realized. However, the experienced returns of bondholders in the past violate this critical assumption. Historic bond returns are biased downward as a measure of expectancy because of capital losses suffered by bondholders in the past. As such, risk premiums derived from this data are biased upwards.

#### **The Arithmetic versus the Geometric Mean Return**

##### **Q. PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURNS IN THE IBBOTSON METHODOLOGY.**

A. The measure of investment return has a significant effect on the interpretation of the risk premium results. When analyzing a single security price series over time (i.e., a time series), the best

measure of investment performance is the geometric mean return. Using the arithmetic mean overstates the return experienced by investors. In a study entitled “Risk and Return on Equity: The Use and Misuse of Historical Estimates,” Carleton and Lakonishok make the following observation: “The geometric mean measures the changes in wealth over more than one period on a buy and hold (with dividends invested) strategy.”<sup>19</sup> Since Mr. Cater’s study covers more than one period (and he assumes that dividends are reinvested), he should be employing the geometric mean and not the arithmetic mean.

**Q. PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM WITH USING THE ARITHMETIC MEAN RETURN.**

68. To demonstrate the upward bias of the arithmetic mean, consider the following example. Assume that you have a stock (that pays no dividend) that is selling for \$100 today, increases to \$200 in one year, and then falls back to \$100 in two years. The table below shows the prices and returns.

Time Period	Stock Price	Annual Return
0	\$100	
1	\$200	100%
2	\$100	-50%

The arithmetic mean return is simply  $(100\% + (-50\%))/2 = 25\%$  per year. The geometric mean return is  $((2 * .50)^{(1/2)}) - 1 = 0\%$  per year. Therefore, the arithmetic mean return suggests that your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual return of 0%. Since after two years, your stock is still only worth \$100, the geometric mean return is

---

<sup>19</sup> Willard T. Carleton and Josef Lakonishok, “Risk and Return on Equity: The Use and Misuse of Historical Estimates,” *Financial Analysts Journal* (January-February, 1985), pp. 38-47.

1 the appropriate return measure. For this reason, when stock returns and earnings growth rates are  
2 reported in the financial press, they are generally reported using the geometric mean. This is because of  
3 the upward bias of the arithmetic mean. Therefore, Mr. Cater's arithmetic mean return measures are  
4 biased and should be disregarded.

5 **Unattainable and Biased Historic Stock Returns**

6 **Q. YOU NOTE THAT HISTORIC STOCK RETURNS ARE BIASED USING THE**  
7 **IBBOTSON METHODOLOGY. PLEASE ELABORATE.**

8 A. Returns developed using Ibbotson's methodology are computed on stock indexes and therefore  
9 (1) cannot be reflective of expectations because these returns are unattainable to investors, and (2)  
10 produce biased results. This methodology assumes (a) monthly portfolio rebalancing and (b)  
11 reinvestment of interest and dividends. Monthly portfolio rebalancing presumes that investors rebalance  
12 their portfolios at the end of each month in order to have an equal dollar amount invested in each  
13 security at the beginning of each month. The assumption would obviously generate extremely high  
14 transaction costs and, as such, these returns are unattainable to investors. In addition, an academic  
15 study demonstrates that the monthly portfolio rebalancing assumption produces biased estimates of  
16 stock returns.<sup>20</sup>

17 Transaction costs themselves provide another bias in historic versus expected returns. The  
18 observed stock returns of the past were not the realized returns of investors due to the much higher  
19 transaction costs of previous decades. These higher transaction costs are reflected through the higher

---

<sup>20</sup> See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics* (1983), pp. 371-86.

1 commissions on stock trades, and the lack of low cost mutual funds like index funds.

2 **Survivorship Bias**

3 **Q. HOW DOES SURVIVORSHIP BIAS TAINT MR. CATER’S HISTORIC EQUITY**  
4 **RISK PREMIUM?**

5 A. Using historic data to estimate an equity risk premium suffers from survivorship bias.  
6 Survivorship bias results when using returns from indexes like the S&P 500. The S&P 500 includes  
7 only companies that have survived. The fact that returns of firms that did not perform so well were  
8 dropped from these indexes is not reflected. Therefore these stock returns are upwardly biased  
9 because they only reflect the returns from more successful companies.

10 **The “Peso Problem”**

11 **Q. WHAT IS THE “PESO PROBLEM” AND HOW DOES IT AFFECT HISTORIC**  
12 **RETURNS AND EQUITY RISK PREMIUMS?**

13 A. Mr. Cater’s use of historic return data also suffers from the so-called “peso problem.” This  
14 issue involves the fact that past stock market returns were higher than were expected at the time  
15 because despite war, depression, and other social, political, and economic events, the US economy  
16 survived and did not suffer hyperinflation, invasion, and the calamities of other countries. Therefore,  
17 historic stock returns are overstated as measures of expected returns.

18 **Market Conditions Today are Significantly Different than in the Past**

19 **Q. FROM AN EQUITY RISK PREMIUM PERSPECTIVE, PLEASE DISCUSS HOW**  
20 **MARKET CONDITIONS ARE DIFFERENT TODAY.**

1 A. The equity risk premium is based on expectations of the future. When past market conditions  
2 vary significantly from the present, historic data does not provide a realistic or accurate barometer of  
3 expectations of the future. As noted previously, stock valuations (as measured by P/E) are relatively  
4 high and interest rates are relatively low, on a historic basis. Therefore, given the high stock prices and  
5 low interest rates, expected returns are likely to be lower on a going forward basis.

6 **Changes in Risk and Return in the Markets**

7 **Q. PLEASE DISCUSS THE NOTION THAT HISTORIC EQUITY RISK PREMIUM**  
8 **STUDIES DO NOT REFLECT THE CHANGE IN RISK AND RETURN IN TODAY'S**  
9 **FINANCIAL MARKETS.**

10 A. The historic equity risk premium methodology is unrealistic in that it makes the explicit  
11 assumption that risk premiums do not change over time. Simply stated, using historic returns to measure  
12 the equity risk premium masks the dramatic change in the risk and return relationship between stocks  
13 and bonds. The nature of the change is that bonds have increased in risk relative to stocks. This  
14 change suggests that the equity risk premium has declined in recent years.

15 Page 1 of Schedule JRW-8 provides the yields on long-term U.S. Treasury bonds from 1926  
16 to 2003. One very obvious observation from this graph is that interest rates increases dramatically from  
17 the mid-1960s until the early 1980s, and since have returned to their 1960 levels. The annual market  
18 risk premiums for the 1926 to 2003 period are provided on page 2 of Schedule JRW-8. The annual  
19 market risk premium is defined as the return on common stock minus the return on long-term Treasury  
20 Bonds. There is considerable variability in this series and a clear decline in recent decades. The high  
21 was 54% in 1933 and the low was -38% in 1931. Evidence of a change in the relative riskiness of

1 bonds and stocks is provided on page 3 of Schedule JRW-8 which plots the standard deviation of  
2 monthly stock and bond returns since 1926. The plot shows that, whereas stock returns were much  
3 more volatile than bond returns from the 1920s to the 1970s, bond returns became more variable than  
4 stock returns during the 1980s. In recent years stocks and bonds have become much more similar in  
5 terms of volatility, but stocks are still a little more volatile. The decrease in the volatility of stocks  
6 relative to bonds over time has been attributed to several stock related factors: the impact of technology  
7 on productivity and the new economy; the role of information (see Federal Reserve Chairman  
8 Greenspan's comments referred to earlier in this testimony) on the economy and markets; better cost  
9 and risk management by businesses; and several bond related factors; deregulation of the financial  
10 system; inflation fears and interest rates; and the increase in the use of debt financing. Further evidence  
11 of the greater relative riskiness of bonds is shown on page 4 of Schedule JRW-8, which plots real  
12 interest rates (the nominal interest rate minus inflation) from 1926 to 2003. Real rates have been well  
13 above historic norms during the past 10-15 years. These high real interest rates reflect the fact that  
14 investors view bonds as riskier investments.

15 The net effect of the change in risk and return has been a significant decrease in the return  
16 premium that stock investors require over bond yields. In short, the equity or market risk premium has  
17 declined in recent years. This decline has been discovered in studies by leading academic scholars and  
18 investment firms, and has been acknowledged by government regulators. As such, using a historic  
19 equity risk premium analysis is simply outdated and not reflective of current investor expectations and  
20 investment fundamentals.

21 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS CONCERNING MR.**



1 **CATER'S EX POST RISK PREMIUM ANALYSES.**

2 A. Mr. Cater's ex post risk premium that he employs in his CAPM and ECAPM models is  
3 erroneous and should be disregarded in estimating CVPS's equity cost rate. Historic risk premium  
4 analyses are subject to a myriad of empirical biases that prevents such risk premiums from being  
5 reasonable expectations of the expected risk premium in a CAPM framework..

6 **Q. TO CONCLUDE THIS DISCUSSION, PLEASE SUMMARIZE MR. CATER'S EX**  
7 **POST RISK PREMIUM STUDY IN LIGHT OF THE EVIDENCE ON RISK PREMIUMS**  
8 **IN TODAY'S MARKETS.**

9 A. The primary issue in both his CAPM and EACPM analyses is the magnitude of the equity or  
10 market risk premium. Mr. Cater's risk premium studies should be ignored due to the size of his equity  
11 risk premium estimates. They are totally out of line with the equity risk premium estimates (a)  
12 discovered in recent academic studies by leading finance scholars and (b) employed by leading  
13 investment banks, management consulting firms, financial forecasters, and corporate CFOs. In both his  
14 CAPM and ECAPM studies, a more realistic market risk premium is in the 2-4 percent range above  
15 Treasury yields.

16 **Q. PLEASE SUMMARIZE MR. CATER'S RISK PREMIUM ANALYSIS.**

17 A. Mr. Cater calculates risk-premium-derived equity cost rate of 9.54% which represents the sum  
18 of the yield on CVPS's recent debt offering of 5.52% and a risk premium of 4.93%. The risk premium  
19 is computed using a regression incorporating the average annual authorized ROEs from electric utility  
20 rate proceedings and the average annual bond yield for the industry in each year.

21 **Q. PLEASE EVALUATE THE BASE YIELD IN MR. CATER'S RISK PREMIUM**

1   **ANALYSIS.**

2   A.     Using the yield on the CVPS's debt inflates the required return on equity in two ways. First,  
3   long-term bonds are subject to interest rate risk, a risk which does not affect common stockholders  
4   since dividend payments (unlike bond interest payments) are not fixed but tend to increase over time.  
5   Second, the base yield in Mr. Cater's risk premium study is subject to credit risk since it is not default  
6   risk-free like an obligation of the U.S. Treasury. As a result, its yield-to-maturity includes a premium for  
7   default risk and therefore is above its expected return. Hence, using a bond's yield-to-maturity as a  
8   base yield results in an overstatement of investors' return expectations.

9   **Q.     WHAT ISSUES DO YOU HAVE MR. CATER'S RISK PREMIUM?**

10   A.     There are two major issues with Mr. Cater's risk premium of 4.93%. First, it involves circular  
11   reasoning since the results of other electric rate cases are employed to derive a risk premium in this  
12   proceeding. If such an approach is used in this and other jurisdictions, then no one will be testing to  
13   evaluate whether the ROE recommendation is above or below investors' required rate of return. The  
14   second issue is related to this observation. Mr. Cater has not performed any analysis to examine  
15   whether the annual allowed ROEs are above, equal to, or below investors' required return. As  
16   discussed above, if a firm's return on equity is above (below) the return that investor's require, the  
17   market price of its stock will be above (below) the book value of the stock. Since Mr. Cater has not  
18   evaluated the market-to-book ratios for electric utilities involved in the annual rate cases, he cannot  
19   indicate whether these allowed ROEs are above or below investors' requirements. As a general notion,  
20   however, since the market-to-book ratios for electric utilities have generally been in excess of 1.0 for  
21   some time, it would indicate that the allowed and earned ROEs for the industry are in excess of those

1 required by investors.

2 **Q. PLEASE SUMMARIZE MR. CATER'S DCF ESTIMATES.**

3 A. Mr. Cater averages the results of two DCF studies using the electric utility group to arrive at an  
4 equity rate for CVPS. The only difference in the two studies is the source of the DCF growth rate. The  
5 one study employs *Value Line* projected EPS growth rates and the other uses the projected EPS  
6 growth rates of Zacks. The Value Line and Zacks DCF models yield recommended equity cost rates  
7 for CVPS of 9.69% and 9.26%, respectively.

8 **Q. PLEASE EXPRESS YOUR CONCERNS WITH MR. CATER'S DCF STUDIES.**

9 A. I have three major concerns with Mr. Cater's DCF equity cost rate studies: (1) a full year's  
10 growth rate adjustment to the dividend yield, (2) the arbitrary elimination of the results for two  
11 companies in his group with low DCF equity cost rates, and (3) the bias in analysts' EPS growth rate  
12 forecasts in his ACE DCF model.

13 **Q. WHY IS IT NOT APPROPRIATE TO ADJUST THE DIVIDEND YIELD BY A**  
14 **FULL YEAR OF GROWTH IN THE DCF MODEL?**

15 A. As previously discussed, the appropriate growth rate adjustment to the dividend yield in the  
16 DCF model is complicated in the regulatory process when the overall cost of capital is applied to a  
17 projected or end-of-future-test-year rate base. Using a full year's growth rate, as Mr. Cater has done,  
18 results in an overstated equity cost rate. This is because current market data is employed to compute an  
19 equity cost rate that is applied to a future rate base. Since the future rate base includes growth  
20 associated with the retention of earnings during the year, the equity cost rate is overstated. Because of  
21 this, I have adjusted the dividend yield for the electric utility group by 1/2 the expected growth rate.

1 **Q. PLEASE DISCUSS MR. CATER'S ARBITRARY ELIMINATION OF THE DCF**  
2 **RESULTS FOR TWO COMPANIES IN HIS *VALUE LINE* DCF STUDY.**

3 A. Mr. Cater's DCF equity cost rate using *Value Line* projected EPS growth rates is also inflated  
4 because he has arbitrarily dropped the results for DPL Inc and Edison International because the DCF  
5 results are too low

6 **Q. WHAT WOULD MR. CATER'S RESULTS HAD BEEN IF HE HAD NOT**  
7 **ELIMINATED THESE DCF RESULTS?**

8 A. He would have arrived at an equity cost rate of 8.8% using Value Line forecasted EPS growth  
9 rates.

10 **Q. WHAT OTHER CONCERN DO YOU HAVE WITH MR. CATER'S DCF**  
11 **APPROACH?**

12 A. Mr. Cater has relied solely on projected EPS growth rates and has ignored all other measures  
13 of growth. This is especially an issue there is a well-known upward bias to the EPS forecasts of Wall  
14 Street analysts.

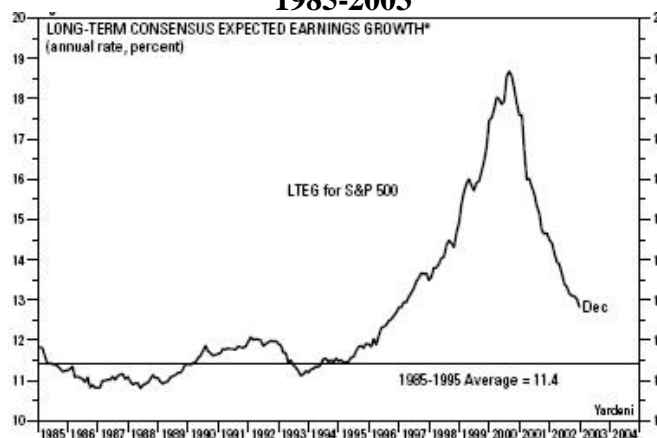
15 **Q. PLEASE REVIEW THE BIAS IN ANALYSTS' GROWTH RATE FORECASTS.**

16 A. Analysts' growth rate forecasts are collected and published by Zacks, First Call, I/B/E/S, and  
17 Reuters. These services retrieve and compile EPS forecasts from Wall Street Analysts. These analysts  
18 come from both the sell side (Merrill Lynch, Paine Webber) and the buy side (Prudential Insurance,  
19 Fidelity).

20 To demonstrate the magnitude of the bias, I have compared the actual five-year EPS growth for  
21 the S&P 500 with the average forecasted EPS growth rate of Wall Street analysts over the past 20

years. The graph below shows analysts' 5-year EPS growth rate forecasts for the S&P 500. Analysts' forecasts for EPS growth for the S&P 500 hovered in the 11.5% range until 1995. These projections then increased dramatically over the next five years (to almost 19.0% by the year 2000) as analysts helped propel the Internet stock market bubble. Forecasted growth has since declined to the 12.0% range.

### Analysts Forecasted 5-Year EPS Growth for the S&P 500 1985-2003

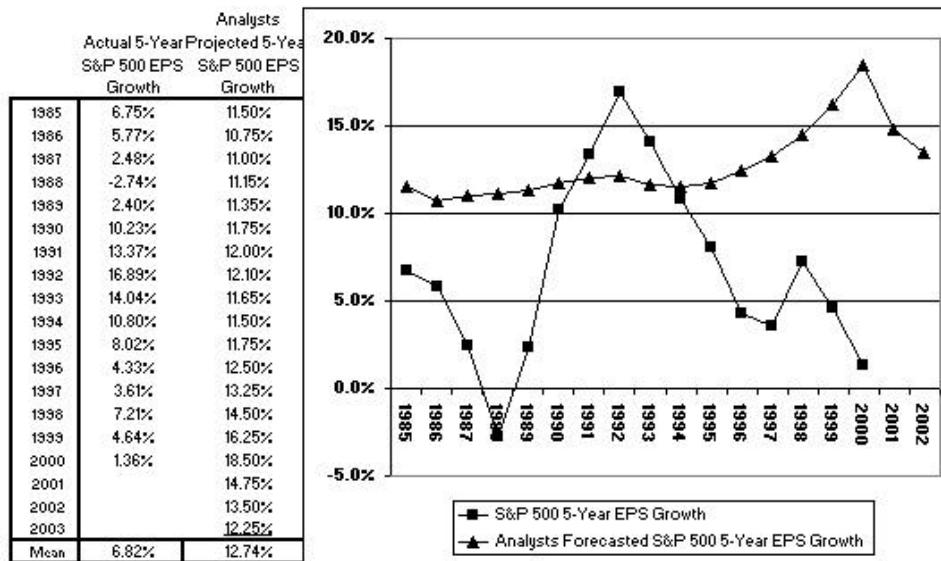


Source: Edward Yardeni, "Stock Valuation Models (4.1), Topical Study No. 58, Prudential Financial (January, 2003).

Meanwhile, companies have been unable to live up to the optimistic forecasts of analysts. In the table and graph below, I have superimposed the analysts' forecasted EPS growth from the graph above, on the actual 5-year EPS growth that the S&P 500 firms produced. For example, in 1995, analysts were projecting 5-Year compounded annual EPS growth of about 11.75%, but companies only generated annual compounded EPS growth over the next five years of 8.02%. Over the entire time period, Wall Street analysts have continually forecasted 5-year EPS growth for the S&P 500 in the

11-16 percent range, but these firms have delivered EPS growth in the 7.0 percent range. The only years when firms met analysts' expectations were in the early 1990s. Over the entire period, on average, analysts' 5-year forecasted EPS growth was 12.74% per year, but companies only produced 5-year EPS growth of 6.82%. Therefore, the bias is obvious and significant.

**Actual Versus Forecasted 5-Year EPS Growth for the S&P 500  
1985-2003**



**Q. WHAT OTHER OBSERVATIONS DO YOU HAVE ABOUT WALL STREET ANALYSTS AND THEIR PROJECTIONS?**

A. The value of Wall Street research has diminished in the wake of New York Attorney General Elliot Spitzer's investigation and the fact that nine major brokerage firms have paid over \$1.5B in the Global Research Regulatory Settlement. With these admitted biases in analysts' research, it seems highly unlikely that investors today would focus squarely on the forecasts of securities analysts in arriving at expected growth. Clearly, investors have learned to be suspicious of the upwardly biased forecasts and

1 stock recommendations of securities analysts.

2 **Q. DO YOU BELIEVE THAT THE CRACKDOWN ON WALL STREET FIRMS HAS**  
3 **LED TO MORE HONEST AND LESS BIASED FORECASTS AND**  
4 **RECOMMENDATIONS?**

5 A. No. The fact is that analysts continue to provide overly positive outlooks for their stocks. Two  
6 *Wall Street Journal* articles focus on this very issue. The first article is titled, “Stock Analysts Still Put  
7 Their Clients First,” and highlights the fact that that despite the recent reforms, analysts still give higher  
8 ratings to companies that employ their firms for investment banking services.<sup>21</sup> In the second article, the  
9 title says it all -- “Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and  
10 the Estimates Help to Buoy the Market’s Valuation.” The following quote provides insight into the  
11 continuing bias in analysts’ forecasts:

12 Hope springs eternal, says Mark Donovan, who manages Boston  
13 Partners Large Cap Value Fund. ‘You would have thought that, given  
14 what happened in the last three years, people would have given up the  
15 ghost. But in large measure they have not.’

16 These overly optimistic growth estimates also show that, even with all  
17 the regulatory focus on too-bullish analysts allegedly influenced by their  
18 firms’ investment-banking relationships, a lot of things haven’t changed:  
19 Research remains rosy and many believe it always will.<sup>22</sup>

20  
21 **Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF MR. CATER’S ACE DCF**  
22 **GROWTH RATE.**

---

<sup>21</sup> Randall Smith, “Stock Analysts Still Put Their Clients First” *Wall Street Journal*, (April 7, 2003), p. C1.

<sup>22</sup> Ken Brown, “Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates

1 A. The growth rate estimates for the electric utility companies are upwardly biased because he has  
2 relied solely on analysts' forecasts of EPS growth to measure a DCF growth rate. He has ignored all  
3 other indicators of growth to measure investors' expectations. As demonstrated and discussed above,  
4 it is well known that analysts' EPS growth rate forecasts are upwardly biased measures of actual  
5 growth. Hence, it is highly unlikely that investors would simply look to these biased forecasts as the only  
6 measures of expected growth.

7 **Q. FINALLY, HOW DOES MR. CATER ATTEMPT TO PUT HIS ROE**  
8 **RECOMMENDATION OF 11.0% IN A 'MACROECONOMIC CONTEXT?'**

9 A. In his summary, Mr. Cater has attempted to justify his 11.0% ROE recommendation in light of  
10 (1) the prospect of higher interest rates and (2) a cursory review of the authorized returns from other  
11 rate cases.

12 **Q. PLEASE COMMENT ON THESE OBSERVATIONS.**

13 A. First, in contrast to Mr. Cater's forecast that long-term interest rates were headed up, they have  
14 declined since he prepared his testimony. The 6.0% yield on 30-year Treasuries that he uses in his  
15 CAPM analysis is now 4.8%. Therefore, the 'macroeconomic context' suggests that a lower ROE is  
16 appropriate. Second, it is not appropriate to use circular reasoning and stale rate case decisions to  
17 justify a ROE recommendation. As I have discussed, capital costs in the U.S. are at their lowest levels  
18 in decades due to (1) interest rates that are at a cyclical low not seen since the 1960s, (2) a decline in  
19 the equity risk premium that has been documented by leading academic scholars, the top investment  
20 banks and management consulting firms, financial forecasters, CFOs and even the Chairman of the

---

Help to Buoy the Market's Valuation." *Wall Street Journal*, (January 27, 2003), p. C1.



1 Federal Reserve Board; and (3) the 2003 Tax Law that cut the tax rate on dividends, thereby reducing  
2 the pre-tax required rate of return of investors.

3 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

4 **A.** Yes it does.

5

## Appendix A

### EDUCATIONAL BACKGROUND, RESEARCH, AND RELATED BUSINESS EXPERIENCE J. RANDALL WOOLRIDGE

J. Randall Woolridge is a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed Faculty Fellow in Business Administration in the College of Business Administration of the Pennsylvania State University in University Park, PA. In addition, Professor Woolridge is Director of the Smeal College Trading Room. He is also a Vice President of the Columbia Group, a public utility consulting firm based in Ridgefield, CT and serves on the Investment Committee of ARIS Corporation, an asset management firm based in State College, PA.

Professor Woolridge received a Bachelor of Arts degree in Economics from the University of North Carolina, a Master of Business Administration degree from the Pennsylvania State University, and a Doctor of Philosophy degree in Business Administration (major area-finance, minor area-statistics) from the University of Iowa. At Iowa he received a Graduate Fellowship and was awarded membership in Beta Gamma Sigma, a national business honorary society. He has taught Finance courses at the University of Iowa, Cornell College, and the University of Pittsburgh, as well as the Pennsylvania State University. These courses include corporation finance, commercial and investment banking, and investments at the undergraduate, graduate, and executive MBA levels.

Professor Woolridge's research has centered on the theoretical and empirical foundations of corporation finance and financial markets and institutions. He has published over 30 articles in the best academic and professional journals in the field, including the *Journal of Finance*, the *Journal of Financial Economics*, and the *Harvard Business Review*. His research has been cited extensively in the business press. His work has been featured in the *New York Times*, *Forbes*, *Fortune*, *The Economist*, *Financial World*, *Barron's*, *Wall Street Journal*, *Business Week*, *Washington Post*, *Investors' Business Daily*, *Worth Magazine*, *USA Today*, and other publications. In addition, Dr. Woolridge has appeared as a guest on CNN's *Money Line* and CNBC's *Morning Call* and *Business Today*.

The second edition of Professor Woolridge's popular stock valuation book, *The StreetSmart Guide to Valuing a Stock* (McGraw-Hill, 2003), was recently released. He has also co-authored *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation, 1999) as well as a new textbook entitled *Modern Corporate Finance, Capital Markets, and Valuation* (Kendall Hunt, 2003). Dr. Woolridge is a founder and a managing director of [www.valuepro.net](http://www.valuepro.net) - a stock valuation website.

Professor Woolridge has also consulted with and prepared research reports for major corporations, financial institutions, and investment banking firms, and government agencies. In addition, he has directed and participated in over 500 university- and company- sponsored professional development programs for executives in 25 countries in North and South America, Europe, Asia, and Africa.

Dr. Woolridge has prepared testimony and/or provided consultation services in the following cases:

**Pennsylvania:** Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Pennsylvania Public Utility Commission: Bell Telephone Company (R-811819), Peoples Natural Gas Company (R-832315), Pennsylvania Power Company (R-832409), Western Pennsylvania Water Company (R-832381), Pennsylvania Power Company (R-842740), Pennsylvania Gas and Water Company (R-850178), Metropolitan Edison Company (R-860384), Pennsylvania Electric Company (R-860413), North Penn Gas Company (R-860535), Philadelphia Electric Company (R-870629), Western Pennsylvania Water Company (R-870825), York Water Company (R-870749), Pennsylvania-American Water Company (R-880916), Equitable Gas Company (R-880971), the

1 Bloomsburg Water Co. (R-891494), Columbia Gas of Pennsylvania, Inc. (R-891468), Pennsylvania-American Water  
2 Company (R-90562), Breezewood Telephone Company (R-901666), York Water Company (R-901813), Columbia Gas of  
3 Pennsylvania, Inc. (R-901873), National Fuel Gas Distribution Company (R-911912), Pennsylvania-American Water  
4 Company (R-911909), Borough of Media Water Fund (R-912150), UGI Utilities, Inc. - Electric Utility Division (R-  
5 922195), Dauphin Consolidated Water Supply Company - General Waterworks of Pennsylvania, Inc. (R-932604),  
6 National Fuel Gas Distribution Company (R-932548), Commonwealth Telephone Company (I-920020), Conestoga  
7 Telephone and Telegraph Company (I-920015), Peoples Natural Gas Company (R-932866), Blue Mountain  
8 Consolidated Water Company (R-932873), National Fuel Gas Company (R-942991), UGI - Gas Division (R-953297), UGI  
9 - Electric Division (R-953534), Pennsylvania-American Water Company (R-973944), Pennsylvania-American Water  
10 Company (R-994638), Philadelphia Suburban Water Company (R-994868;R-994877;R-994878; R-9948790), Philadelphia  
11 Suburban Water Company (R-994868), Wellsboro Electric Company (R-00016356), Philadelphia Suburban Water  
12 Company (R-00016750), National Fuel Gas Distribution Company (R-00038168), Pennsylvania-American Water  
13 Company (R-00038304).

14  
15 **New Jersey:** Dr. Woolridge prepared testimony for the New Jersey Department of the Public Advocate, Division of  
16 Rate Counsel: New Jersey-American Water Company (R-91081399J), New Jersey-American Water Company (R-  
17 92090908J), and Environmental Disposal Corp (R-94070319).

18  
19 **Hawaii:** Dr. Woolridge prepared testimony for the Hawaii Office of the Consumer Advocate: East Honolulu  
20 Community Services, Inc. (Docket No. 7718).

21  
22 **Delaware:** Dr. Woolridge prepared testimony for the Delaware Division of Public Advocate: Artesian Water  
23 Company (R-00-649).

24  
25 **New York:** Dr. Woolridge prepared testimony for the County of Nassau in New York State: Long Island Lighting  
26 Company (PSC Case No. 942354).

27  
28 **Ohio:** Dr. Woolridge prepared testimony for the Ohio Office of Consumers' Council: SBC Ohio (Case No. 02-1280-TP-  
29 UNC R-00-649).

30  
31 **Connecticut:** Dr. Woolridge prepared testimony for the Office of Consumer Counsel in Connecticut: United  
32 Illuminating (Docket No. 96-03-29).

33  
34 **Washington, D.C.:** Dr. Woolridge prepared testimony for the Office of the People's Counsel in the District of  
35 Columbia: Potomac Electric Power Company (Formal Case No. 939).

36  
37 **Washington:** Dr. Woolridge consulted with trial staff of the Washington Utilities and Transportation Commission on  
38 the following cases: Puget Energy Corp. (Docket Nos. UE-011570 and UG-011571); and Avista Corporation (Docket  
39 No. UE-011514).

40  
41 **Kansas:** Dr. Woolridge prepared testimony on behalf of the Kansas Citizens' Utility Ratepayer Board Utilities in the  
42 following case: Western Resources Inc. (Docket No. 01-WSRE-949-GIE).

43  
44 **FERC:** Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the  
45 following cases before the Federal Energy Regulatory Commission: National Fuel Gas Supply Corporation (RP-92-73-  
46 000) and Columbia Gulf Transmission Company (RP97-52-000).

## J. Randall Woolridge

### **Office Address**

609-R Business Administration Bldg.  
The Pennsylvania State University  
University Park, PA 16802  
814-865-1160

### **Home Address**

120 Haymaker Circle  
State College, PA 16801  
814-238-9428

### **Academic Experience**

**Professor of Finance**, the Smeal College of Business Administration, the Pennsylvania State University (July 1, 1990 to the present).

**Director, the Smeal College Trading Room** (January 1, 2001 to the present)

**Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration** (July 1, 1987 to the present).

**Associate Professor of Finance**, College of Business Administration, the Pennsylvania State University (July 1, 1984 to June 30, 1990).

**Assistant Professor of Finance**, College of Business Administration, the Pennsylvania State University (September, 1979 to June 30, 1984).

### **Education**

**Doctor of Philosophy in Business Administration**, the University of Iowa (December, 1979). Major field: Finance.

**Master of Business Administration**, the Pennsylvania State University (December, 1975).

**Bachelor of Arts**, the University of North Carolina (May, 1973) Major field: Economics.

### **Books**

James A. Miles and J. Randall Woolridge, *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation), 1999

Patrick Cusatis, Gary Gray, and J. Randall Woolridge, *The StreetSmart Guide to Valuing a Stock* (2<sup>nd</sup> Edition, McGraw-Hill), 2003.

J. Randall Woolridge and Gary Gray, *The New Corporate Finance, Capital Markets, and Valuation: An Introductory Text* (Kendall Hunt, 2003).

### **Research**

He has published over 30 articles in the best academic and professional journals in the field, including the *Journal of Finance*, the *Journal of Financial Economics*, and the *Harvard Business Review*.